THE

AMERICAN GAS-LIGHT JOURNAL.

THE OFFICIAL GAZETTE OF

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Dithridge's Patent
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ARRANGED BY STATES AND COUNTIES,

Showing where Gas-Works and Water-Works are Wanted.

NEW HAMPSHIRE.

10 Counties, 377 Towns, 9 Gas-Works, 1 Water-Works.

Belknap County.

Alton,	Gilmanton Iron W'ks,	North Barnstead,
Barnstead,	*Laconia*, (c. h.,)	North Sanbornton,
Centre Barnstead,	Lake Village,	Sanbornton,
Centre Harbor,	Lower Gilmanton,	Sanbornton Bridge,
East Sanbornton,	Meredith Centre,	Upper Gilmanton,
Gilford Village,	Meredith Village,	Weir's Bridge,
Gilmanton,	New Hampton,	West Alton.

Carroll County.

Bartlett,	Freedom,	Sandwich,
Brookfield,	Horn's Mills,	South Tamworth,
Centre Conway,	Leighton's Corners,	South Wolfboro',
Centre Ossipee,	Lower Bartlett,	Tamworth,
Centre Sandwich,	Mackerel Corner,	Tamworth Iron W'ks,
Conway,	Madison,	Tuftonboro',
East Madison,	Melvin Village,	Union,
East Moultonboro',	Moultonboro',	Wakefield,
East Wakefield,	North Conway,	Water Village,
Easton Centre,	North Sandwich,	West Ossipee,
Effingham,	North Wakefield,	Wolfboro',
Effingham Falls,	North Wolfboro',	Wolfboro' Centre.
	Ossipee, (c. h.,)	

Cheshire County.

Alstead,	Jaffrey,	Rindge,
Ashuelot,	*Keene*, (c. h.,)	South Stoddard,
Chesterfield,	Marlboro',	Stoddard,
Chesterfield Factory,	Marlboro' Depot,	Sullivan,
Drewsville,	Marlow,	Surry,
Dublin,	Munsonville,	Swanzey,
East Jaffrey,	Nelson,	Troy,
East Sullivan,	New Alstead,	Walpole,
East Westmoreland,	North Richmond,	Westmoreland,
Fitzwilliam,	Paper Mill Village,	Westmoreland Depot,
Gilsum,	Pottersville,	Westport,
Harrisville,	Richmond,	West Swanzey,
Hinsdale,		Winchester.

Coos County.

Berlin,	Errol,	Shelburn,
Berlin Falls,	Gorham,	Stark,
Carroll,	Groveton,	Stewartstown,
Clarksville,	Jackson,	Stratford,
Colebrook.	Jefferson,	Whitefield,
Columbia,	*Lancaster*, (c.h.,)	Wentworth's Location
Coos,	Milan,	West Milan,
Crawford's House,	Northumberland,	West Stewartstown,
Dalton,	Pittsburgh,	White Mountain H'se.
	Randolph,	

Grafton County.

Alexandria,	Grafton Centre,	North Monroe,
Bath,	Groton,	Orford,
Benton,	Hanover,	Orfordville,
Bethlehem,	Hanover Centre,	Piermont,
Bridgewater,	*Haverhill*, (c. h.,)	Profile House,
Bristol,	Haverhill Centre,	*Plymouth*, (c. h.,)
Campton,	Hebron,	Rumney,
Campton Village,	Hill,	South Danbury,
Canaan,	Holderness,	Sugar Hill,
Danbury,	Landaff,	Thornton,
Dorchester,	Lebanon,	Warren,
East Canaan,	Lincoln,	Wentworth,
East Haverhill.	Lisbon,	West Campton,
East Landaff,	Littleton,	West Canaan,
East Lebannon,	Lyman,	West Enfield,
Ellsworth,	Lyme,	West Lebanon,
Enfield,	Monroe,	West Littleton,
Enfield Centre,	North Dorchester,	West Plymouth,
Flume,	North Groton,	West Rumney,
Franconia,	North Haverhill,	West Thornton,
Grafton,	North Liston,	Woodstock.
	North Littleton,	

Hilsboro' County.

Amherst, (c. h.,)	Hillsboro' Bridge,	North Lyndeboro',
Amoskeag,	Hillsboro' Centre,	North Weare,
Antrim,	Hollis,	Oil Mill Village,
Bedford,	Hudson,	Pelham,
Bennington,	Lyndeboro',	Peterboro',
Brookline,	Manchester,	Reed's Ferry,
Deering,	Mason,	South Lyndeboro',
East Weare,	Mason Village.	South Merrimack,
Francistown,	Milford,	South Weare,
Goffstown,	Mount Vernon,	Temple,
Goffstown Centre,	Nashua,	Thornton's Ferry,
Greenfield,	New Boston,	Weare,
Hancock,	New Ipswich,	West Wilton,
Hillsboro',	North Branch,	Wilton.

Merrimack County.

Allenstown,	Henniker,	Salisbury,
Andover,	Hookset,	Shaker Village,
Boscawen,	Hopkinton,	South Bradford,
Bow,	Loudon,	South Newbury,
Bradford,	Loudon Centre,	Suncock,
Canterbury,	Loudon Ridge,	Sutton,
Chichester,	Mast Yard,	Warner,
Concord, (c. h.,)	Newbury,	West Andover,
Contoocook Village,	New London,	West Boscawen,
Dunbarton,	North Chichester,	West Concord,
East Andover,	North Dunbarton,	West Henniker,
East Concord,	Northfield Depot,	West Hopkinton,
Epsom,	North Sutton,	West Salisbury,
Fishersville,	Pembroke,	Wilmot,
Franklin,	Pittsfield,	Wilmot Flat.
	Rowe's Corner,	

Rockingham County.

Atkinson,	Fremont,	Nottingham,
Atkinson Depot.	Greenland,	Nottingham T'npike,
Auburn,	Greenland Depot,	Plaistow,
Brentwood,	Hampstead,	*Portsmouth*, (c. h.,)
Candia,	Hampton,	Raymond,
Candia Village,	Hampton Falls,	Rye,
Chester,	Kensington,	Salem,
Danville,	Kingston,	Sandown,
Deerfield,	Londonderry,	Seabrook,
Deerfield Centre,	Newington,	South Deerfield,
Derry,	New Market,	South Hampton,
East Chester,	Newton,	South Kingston,
East Kingston,	North Hampton,	South New Market,
East Northwood,	N'th Hampton Depot,	Stratham,
Epping,	North Londonderry,	West Northwood,
Exeter, (c. h.,)	North Salem,	West Windham,
Fessenden Mills,		Windham.

Strafford County.

Barrington,	Great Falls,	Rochester,
Centre Strafford,	Lee,	Salmon Falls,
Dover, (c. h.,)	Madburg,	Strafford,
Downing's Mills,	Middleton,	Strafford Blue Hill,
Durham,	Milton,	Strafford Corner,
Farmington,	Milton Mills,	Wadley's Falls,
Gonie,	North Barrington,	West Milton.
	North Strafford,	

Sullivan County.

Acworth,	George's Mills,	North Graham,
Charlestown,	Goshen,	Plainfield,
Claremont,	Grantnam,	South Acworth,
Cornish Flat,	Langdon,	South Charleston,
Croydon,	Lempster,	Springfield,
Croydon Flat,	Meriden,	Sunapee,
East Lempster,	Mill Village,	Unity,
East Plainfield,	Newport,	Washington,
East Unity,	North Charleston,	West Claremont,
East Washington,		West Springfield.

TERRIBLE COLLIERY ACCIDENT IN FRANCE.—A terrific accident occurred recently, on a Sunday afternoon, in a coal mine at Bessèges, in the Gard, France. The mine having been flooded by heavy rains, a landslide took place, and more than 100 workmen were either smothered or drowned. Intelligence of the casualty having reached the Prefect of the Gard at 10 o'clock at night, he immediately proceeded to the mine in a special train, accompanied by the chief-engineer of the department and several other officials. It was ascertained that 117 miners were missing, and that 1,800,000 cubic yards of water had rushed into the mine, and caused numerous landslides. Three months will be required to pump out the water. By some individuals, the engineers are blamed for the catastrophe, but it seems to be generally believed that a water-spout burst and caused a torrent, which flooded the mine with such rapidity that even the engineers had not time to save themselves. An explosion of gas occurred at the same time, by which a portion of the mine was blown up. Telegrams from Montpellier state that every effort is being made to rescue the workmen buried by the accident in the Lalle mine, and it was hoped soon to establish communication with some of the still living sufferers. More detailed accounts from the scene of the catastrophe are much less hopeful than the semi-official dispatches. Though every means of rescuing the workmen have been taken, there is but little probability of saving the lives of those who are buried in the mine. The utmost that can be done is to bring the bodies to the surface. The number of workmen missing on a call of the roll, and considered as killed by the accident, is nearly 300.

ELECTRIC LIGHT IN COAL MINES.—Dr. John Taylor, of Glasgow, in some remarks on "Fire-Damp in Coal Mines," addressed to the Philosophical Society of that city, printed in their *Proceedings*, suggests the employment of hermetically sealed vacuum tubes, which can now be steadily illumined by means of the induction current from the Ruhmkorff coil and similar apparatus. These luminous tubes could be suspended in the center of the chamber, and if accidentally broken, no harm would ensue but the extinction of the light, as the brush from the exposed end of the wire of the voltaic battery would not ignite a gaseous mixture. The battery could be kept in a distant part of the down-cast passage, where no danger of explosion could occur; and all that could be required would be the renewal of the exciting liquor. Dr. Taylor also figures and describes an apparatus devised for constantly indicating the proportion of fire-damp in the atmosphere of coal-mines, and for giving alarm when the quantity approaches the explosion point.

SAINT JOHN, N. B.—A prosperous gas company. Capital $200,000, with but $174,000 in use. Stock ruling at 10 per cent. premium. Made 15,000,000 c. f. in 1860. Light 230 public lamps at $20 per annum each; use the coal-tar for fuel; mix Lesmahago, Cannel, and Newcastle coal, ¼ each, producing 9,600 c. f. gas, and 14 cwt. coke to the ton. The reports are very intelligent, and always promptly given when asked for.

MILITARY BALLOONING.—The balloon department in the army service on the Potomac is becoming one of considerable importance. Professor La Mountain, the boldest of our aeronauts, has just furnished valuable information to the government and General McClellan by his late daring flight. On October 4th, a balloon was seen passing over Washington, which was thought by many to have started from the rebel camp on an aerial reconnoissance; but as it subsequently descended in Maryland, it proved to be the air-ship of La Mountain, which had ascended from the Union camp of the Potomac. It appears that when La Mountain rose to a certain distance he cut the rope which connected his balloon with the earth, regardless of the danger, and soared up to an elevation of a mile and a half, and got directly over the rebel lines. Here he was enabled to make a perfect observation of their position and all their movements, the results of which he has communicated to headquarters, and which are said to be of the utmost importance. When La Mountain completed his observation he threw out sufficient ballast to enable him to rise to a height of three miles, when he fell in with a counter current which carried him back in the direction of Maryland, thus passing over Washington and coming down in safety. This is probably the most important aerial reconnoissance on record.

HILL'S GAS-PURIFYING PROCESS.—At the recent meeting of the British Association for the Advancement of Science, Professor H. E. Roscoe, well known as the translator of Bunsen's admirable treatise on gasometry, read a report which had been prepared by himself, Dr. Schunck, and Dr. Angus Smith, "On the manufactures of the South Lancashire district." In this report, in which particular attention was paid to chemical manufactures, it was stated that a new source of sulphuric acid was found in the waste material used in purifying gas by Hill's process. In this process, hydrated peroxide of iron is used instead of lime. When this is saturated with the impurities originally contained in the crude gas, it is mostly converted into sulphuret of iron; and Mr. Spence uses this material for the generation of sulphurous acid, which, in the leaden chamber, is converted by oxidation into sulphuric acid. From one ton of this material, about 1¼ tons of hydrated sulphuric acid are obtained. Thus the sulphur, which causes such annoyance to effect its expulsion from gas, is, by the application of science, converted into a valuable commodity.

PENALTY FOR USING COAL AS FUEL.—As an evidence of the vast difficulty experienced by introducers of new articles against the prejudices of a community, we may mention a fact in relation to the first employment of coal as a fuel. When coal was first introduced into England, the prejudice against it was so strong that the Commons petitioned the Crown to prohibit the "noxious" fuel. A royal proclamation having failed to abate the nuisance, a commission was issued to ascertain who burned coal within the city of London and its neighborhood, and to punish them by fine for the first offense, and by demolition of their furnaces if they persisted in transgressing. A law was finally passed making it a capital offense to burn coal in the city, and permitting it to be used only in the forges in the vicinity. It is stated that among the records of London, a document has been found, stating that in the time of Edward I. a man was *tried, convicted, and executed, for the crime of burning coal in London.* It took three centuries to entirely efface this prejudice.

GAS IN ENGLAND.—Inspectors of meters are now being appointed in accordance with the requirements of the new act for regulating measures in the sale of gas. By this act all consumers are required to use stamped meters, and any one fixing or using an unstamped meter after October 13th, will be liable to a penalty of £5.

The Ashford Gas Company have declared a dividend of 5 per cent., and reduced the price of their gas to 5s. per 1,000 cubic feet. They are building a new gas-holder 54 feet diamater, and 20 feet deep, capable of containing 46,000 cubic feet.

The Jedburgh Gas Company have been prevailed upon to reduce the price of their gas from 9s. to 6s. 8d. per 1,000 feet—rather a heavy fall.

WATER-WORKS OF AMERICA.

JERSEY CITY, N. J.

The semi-annual Report of the Water Commissioners for the half year ending June 30, 1861, of Jersey City, N. J., has just been issued. It contains much interesting information relative to the position of the company, and suggestions of some importance to the engineering profession generally. The operations of the company are such as to require great vigilance and constant personal attention on the part of the officials.

The regular half-yearly report of Robert C. Bacot, Esq., the Engineer and Superintendent, dated July 1st, 1861, is annexed. It exhibits, in a condensed and convenient form, the present state of the works, and their operation during the period named, and contains substantially the information called for by law, respecting the condition of the water-works and sewers.

PUMPING ENGINE.

For several years past, it has been felt that a dependence upon a single pumping engine at Belleville for the supply of water, was altogether too precarious to be consistent with safety. A slight accident might at any moment have so disabled that engine, as to have prevented its action for weeks. The calamitous effects of such an occurrence upon the people and the property of the city, could be sufficiently appreciated to make the risk appear very dangerous, not to say presumptuous.

A contract for the erection of a second pumping engine was determined upon during the last year, as a measure of precaution and security. This important work (a Cornish engine), designed to be of the same capacity, and nearly of the same pattern as the one now in use, is almost completed. The old engine built at the West Point Foundry, which has been in constant operation for more than seven years, has given great satisfaction; and as great expectations are entertained of the one about being completed. The contract price of this work is $26,000.

SHORTNESS OF SUPPLY.

During the whole of the past year the whole supply of water capable of being furnished by the main pipe, has been consumed. Sometimes a little more, and sometimes a little less than the capacity of the pipe could render, has been drawn from the distributing reservoir. By strict vigilance on the part of the superintendent and his assistants, and by the application of meters at the establishments of many of the larger consumers, the water-line of the distributing reservoir has recently been gradually rising. Still it is apparent that any material increase in the demand will immediately cause a deficiency of water. The people and the business operations of two cities, numbering 40,000 inhabitants, are now depending upon the works. Any appreciable increase in the population, or even a small extension of manufacturing or other business needing large quantities of water daily, must be attended with serious embarrassment to this board, and injury to all consumers, unless an increased supply is ready to be thrown into the distributing reservoir. The authorities of the city of Hudson, N. J., are now desirous of negotiating for water for certain portions of their city. It is stated, that the financial interests of the Jersey City Board would be greatly promoted by extending to Hudson City a supply on the same terms as are contained in the contract with Hoboken. But a very short period of general prosperity would inevitably occasion a demand, even within the territorial limits of the present supply, for more than double the quantity of water now used.

The conclusion is evident, that unless the Board shall be prepared to give undoubted assurances of a full supply for the future, it will be virtually and effectually discouraging the extension of buildings, manufactories and other business, constituting the wealth and permanent prosperity of the city. For the comfort of a residence, as well as the actual marketable value of property in Jersey City as elsewhere, is indissolubly dependent upon confidence in the continued supply of an abundant quantity of pure and wholesome water. As the trustees of such interests, the Board deem it a part of their duty to be prepared at all times to give such confidence and assurance to any from abroad, who may be attracted thither for a settlement and for business, and to the present citizens, that the increase of population, and of business, shall not in any degree diminish to them the use and accommodations of the Passaic water.

The Board are now deliberating whether some provision of a permanent nature ought not to be made at once for the enlargement of the supply. Many years will not elapse before the second main of thirty-six inches in diameter will be needed throughout the whole distance between the reservoirs, to afford the adequate quantity of water. Competent engineers declare that a considerable increase to the supply could be secured by laying down only a single mile of the thirty-six inch main from the Belleville reservoir eastward, and that the progressive demand might be successively supplied by extending the new main eastward, until it reaches the distributing reservoir at Bergen hill. Two mains would then be completed, one of twenty inches, and the other of thirty-six inches in diameter, which would suffice for many years to come.

This progressive enlargement has the recommendation that the outlay for its construction would keep pace with the increase of revenue; and consequently the increased yearly interest on bonds would not diminish the annual surpluses due to the sinking fund or redemption account.

CONDUIT ACROSS THE HACKENSACK.

Another matter connected with the safety of the works as well as with the increase of supply, relates to the provision of a second conduit or pipe across the Hackensack river. The works there are every season in a good deal of peril from ice. Should the present bridge be carried away, or even any part of it be broken, the consequences would probably be far more injurious to the city than the value of the outlay required for a reasonable preventive against a break at that place of the connection between the two reservoirs.

It has been suggested that the danger of such a misfortune may be completely overcome by laying a pipe of from thirty-six to forty inches in diameter upon the bottom of the river and across its bed; such an arrangement has been successfully made at Boston across the Chelsea river. This plan, as well as others, looking to a greater security at that locality, are now in course of examination.

The attention of the Commissioners has for a long time past been drawn to the mode of supplying steamboats and other large consumers of water. It became evident that immense quantities of water, wholly disproportioned to the revenue collected for the same, were daily drawn, especially along the wharves and docks.

An alarming decrease of water in the distributing reservoir was taking place in the early part of the year 1860. Every expedient that could be safely resorted to, in order to keep up the reserve in the reservoir, was tried in vain. Regulations designed to check inordinate waste were adopted, with but partial success. Many complaints came before the public alternately from the Board, and from consumers affected by the efforts of the Board to abate the evil.

WATER METERS.

Under the exigencies of the case, resort was had to an actual measurement by meters of all water supplied to steamtugs, and afterwards extended the system of actual measurement to all *steamboats, ferries, railroad companies, and all manufacturing establishments in Jersey City*, and the same rule has been applied to consumers of the same classes in Hoboken and Hudson City. This system is now in actual operation. About sixty of H. R. Worthington's meters, of various sizes, have been provided. Many of them have been already set, and are performing their work with regularity, and to the entire satisfaction of the Board. All of them will be set before the expiration of the ensuing quarter year; and every place within the scope of the rule above mentioned, will be supplied hereafter in the same manner.

For the purpose of avoiding all invidious differences in rates among the large consumers, the price has been fixed to them in Jersey City at the uniform minimum rate of one cent for each one hundred gallons indicated by the meter, and in Hoboken and other places not in Jersey City, at a rate twenty per cent. higher. While this system will do justice relatively among the large consumers, two very important results are already realized therefrom to the Board. The first is, an immense saving of water; and the second, a revenue in the aggregate from measured water at the low rate now uniformly charged according to the meter, fully equal to that formerly obtained from the same sources under the unequal rates applied to the conjectural quantity of consumption. We find the system giving very general satisfaction, and the practice of actual measurement will undoubtedly be adhered to in the supply of the classes above mentioned. In all these cases each consumer has a direct interest in the prevention of waste upon his premises; and should waste be allowed, the Board will collect value for every gallon thereof.

From the experience, as well as from the often repeated testimony of water boards in other cities, there is reason to think that the ruinous consequences of wanton waste cannot in any great degree be checked or avoided by the usual rules and regulations. Whereas, by the introduction of the meter, the pecuniary value of the injury, if committed, is readily secured to the public treasury, and the financial character of the works in no degree improvidently impaired.

In making the rate of one cent per one hundred gallons to the above classes of consumers, the Board had regard both to the policy of providing water to manufactories, companies, &c., doing business in the city, at the lowest possible price; and also to that provision of law which requires the prices of water to be fixed with reference to ultimately paying from the proceeds thereof the interest and principal of the "Jersey City Water Scrip." All consumers should be made to pay annually somewhat more than the actual current cash cost of the water. Every gallon of water consumed should require the payment of something towards the redemption of the construction bonds as they fall due.

By the engineer's table annexed to his January and July reports of the present year, it will be seen that 790,000,000 of gallons of water have been consumed during the year ending July 30th, 1861. During the same period the expenses payable out of the income of the works, including interest on construction bonds, have been about $63,400 (which is $3,000 less than in the preceding year), consequently every 12,460 gallons of water consumed during the year ending June 30th, 1861, has cost the Board a cash outlay of one dollar, without taking into account the amounts paid for pipe extension, engine building, and other works of extension; and also the progressive wear and gradual depreciation incident to all parts of the works. Every 100 gallons has taken 8 25-1000 mills out of the treasury. By the meter system the consumer will repay ten mills for the same 100 gallons, being 1 975-1000 mills over the cash actually paid by the Board therefor. Assuming that a factory uses an average of 1,000 gallons per day, for which it pays ten cents according to the present rates, in the course of the year the establisnment having used 365,000 gallons of water, will have paid only $7 21 over and above what the Board has actually advanced in cash to furnish the supply. This $7 21 will be the real amount which such establishment pays annually towards the redemption of over $700,000 of bonds maturing within from sixteen to twenty-two years from this time, as well as towards a compensation for the gradual wear and decay of the works.* Surely it will not be contended that the present rates for steamboats, ferries, railroads, manufactories, &c., are too high; nor can the Board be censured if they refuse to supply any establishment or consumer at lower rates.

It is a matter of regret that no meter has as yet been introduced into the market sufficiently cheap to admit of the application of the system of actual measurement to small consumers, or private dwelling-houses. By reason of this desideratum, an inequality exists among the small consumers, both as to the quantity used and the quantity wasted at different dwellings, for the same amount of water rent. Should a correct and reliable meter of sufficient cheapness be hereafter produced, and successfully tested, the practice of measuring water should immediately be made as general as that of measuring gas now is, and a happy revolution would be produced in the management of all the water-works in the country.

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* Considering the depreciation of the works from wear and decay at 1 per cent. per annum on the cost (which is deemed a low estimate), then the 365,000 gallons of consumption in the case supposed will give only $3 91 of actual clear profits per annum for the redemption fund, from said factory instead of $7 21.

The Engineer of the Jersey City Water-Works is engaged, by the use of a few small meters, in making observations of the consumption of water at various private dwellings, which will, doubtless, produce some interesting statistics, and may form the basis of a further correction of the evils attending a useless waste of water by private consumers.

FLUSHING THE SEWERS.

Attention is called to that part of the Engineer's report, showing the condition of the various main sewers built on the general plan of sewerage. His observations were made in the months of January and February last. In all of the sewers a much greater deposit of mud and sand remains than is consistent with their proper efficiency for draining purposes. A great deal of the difficulty may be owing to the neglect of cleaning out the receiving basins. But even this cause of the deposit would have been counteracted could the sewers have been flushed as contemplated by the plan. Indeed it is sufficiently demonstrated, that without the attendant means of flushing, the plan is a failure; whereas, with the use of this cleansing process, the sewers would be kept clean at little or no expense.

Another advantage contemplated in the general plan, to arise from cleaning the sewers by flushing, is the protection of health. The frequent and active flow of a current of salt water from one end of a sewer to the other, would carry off the deposit, without the nauseous and sickening effluvia attending its removal through the manholes into the streets, and would keep the sewer constantly clean and innoffensive. These sewers ought to be thoroughly cleansed.

The Board has not the right, nor the funds, to cleanse sewers in the way ordinarly pursued. Their powers are limited to the flushing only. But the sewers having no connection with any canal or reservoir of salt water for flushing purposes, their hands are tied, and the only authorities possessing legal power to expend money for this purpose are the Mayor and Common Council, and they cannot perform the work at present in any other manner than has been heretofore practised, namely, by removing the sediment through the manholes into the street.

In view of these facts, it becomes important to consider whether the suggestions of the Engineer with reference to the use of the canal in Paterson street for flushing purposes ought not to be immediately adopted. It would seem that with regard to all the new sewers north of Railroad Avenue, the advantages of flushing might by that means be obtained at trifling expense. As to the Newark avenue and Wayne street sewer, its present western terminus is thought to be too high to be washed at that point by the above-mentioned canal. But the entire length of the South 7th, South 5th, and South 3d street sewers, and those north of these, hereafter to be built, could be effectually cleansed from the Paterson street canal.

FINANCIAL CONDITION OF THE WORKS.

The financial condition of the Board is rapidly improving, and verifying every reasonable expectation entertained during the earlier years of the works. Not only have the expenditures legitimately chargeable to the water-works continued to be met without recurring to the surface taxes and deficiency taxes, but large advances have been taken therefrom in payment of extension of the works.

With the last report of the Commissioners, a memorandum was exhibited showing that from July 1st, 1857, to January 1st, 1861, over $30,000 had been taken from the general funds of the Board and applied to extension of the works. This amount has been much increased since January 1st, by payments made on account of the new pumping engine, and for pipe extensions. These facts would indicate that the time has come for separating the moneys derived from the income of the water-works from all other funds and moneys used by the Board.

From previous estimates of receipts and expenditures, a surplus of not less than $15,000 must accrue from the revenue of the year now commencing. It is to be expected, however, that the disordered condition of business will somewhat disturb the regularity of receipts, and a smaller quantity of measured water may be required than heretofore by some manufactories. Yet under the most unfavorable circumstances that may be apprehended, it is quite certain that the earnings of the works for the ensuing year will exceed the expenditures legitimately chargeable to and payable out of the income, by about that amount.

There are 3,150 houses in Jersey City, chargeable by the rules of the Board as "dwellings," and that the gross sum of water rents to be derived from them is $31,516, showing an average of about $10 per annum for each house, representing about $143 of capital or permanent value supposed to be induced by the introduction of water.

The Board are desirous of making some more definite and systematic arrangement for the redemption of the "Jersey City Water Scrip." Heretofore all surplus money has been absorbed in the extension of the works, and in advances upon the building of sewers —the latter, in due time, returning on the collection of sewerage assessments. It may appear more convenient to liquidate the costs of a gradual extension of the works out of any surplus cash that may be in hand, than to save the surplus, and issue bonds or scrip for the construction of extensions. Yet the requirements of the water law, as well as the promptings of equity towards all concerned, discountenance the payment of any other than the following current expenditures out of the income of works, viz.: *the interest on the bonds or scrip, the expenses for maintaining the works and for raising and distributing the water, salaries, wages, and incidental charges.* All surplus remaining after these expenditures are made, is by law expressly appropriated to the purchase of "scrip," or bonds issued for the construction of the works, if the same can be obtained at reasonable rates; or if that cannot be effected, then to be safely invested by the Water Commissioners, and allowed to remain as a sinking fund, to be applied to the payment of the scrip at its maturity. Hence it follows, that all extensions of the works properly falling under the denomination of *construction* should be paid for by new scrip or bonds, redeemable at a distant period; and all moneys necessarily required in the building of sewers, to be afterwards refunded from assessments, should be obtained from temporary loans upon hypothecated bonds, as provided for by the 16th section of the supplemental act of March, 1854.

This system of separating the funds of the Board would make intelligible and rational the assertion that the water-works are abundantly able to pay off the funded debts at or before maturity, and thereafter to supply the citizens with water at only a nominal cost.

The "construction account" was closed July 1st, 1857. From a cursory examination of the receipts and the expenditures properly chargeable to the same, and above enumerated since July 1st, 1857, the following results are derived:

RECEIPTS.

For the year ending June 30th, 1858, about						$51,000
"	"	"	"	1859,	"	69,500
"	"	"	"	1860,	"	76,500
"	"	"	"	1861,	"	69,750

EXPENSES.

During the year ending June 30th, 1858, about						$53,600
"	"	"	"	1859,	"	62,600
"	"	"	"	1860,	"	66,400
"	"	"	"	1861,	"	68,400

Showing a surplus belonging to the redemption fund of over $20,000.

There is no statement showing what amounts of unpaid water rents for the above four years are outstanding, but it may be assumed that it was not less than $20,000 on the 30th of June last. It therefore seems that from July 1st, 1857, to June 30th, 1861, the expenditures for interest and the other objects above enumerated as payable out of the income, have fallen below the rentals of the works collected and uncollected by no less than $40,000, giving an average surplus of $10,000 per annum.

CONSTRUCTION OF SEWERS.

This Board has been for a long time encumbered with heavy liabilites incurred in building sewers. In August, 1860, these liabilities were $65,000, which amount was by the first of January reduced to $60,000, and since that time it has been further reduced to $50,000 by payments made out of the general funds of the Board.

It appears by the "statement of the lengths, and cost of sewers built in Jersey City, under the general plan of sewerage," accompanying the report of the Engineer, that since the year 1854 sewers have been built by the Water Commissioners costing $115,863 02; all or the most of which amount has from time to time been advanced by the Commissioners in anticipation of the assessments therefor. If the collection of these assessments could be made promptly, a serious complication of accounts, attended at all times with inconvenience and difficulty of apprehension, would be avoided. By the present practice the assessment roll remains in the hands of the Commissioners for a certain number of days. During this period it is at all times readily seen what is the precise state of that sewer's account. The registrar can inform the Board in a moment what is the precise sum paid upon it, and how much is outstanding. But from the time the assessment goes into other hands, until it has been collected, which may be years afterwards, the Board has not the power of ascertaining at will what is the real condition of that particular account. Moneys are constantly collected, and from time to time returned to the Board, arising from a number of distinct assessments or arrear lists, and as often as possible the collector and comptroller do designate specifically on what accounts such collections and payments have been made. But it is not possible that they can do so daily, or even weekly; and yet the Commissioners ought, in order to an intelligent management of the finances, to have before them at any hour the true and precise state of every account in arrear.

SUPERINTENDENT AND ENGINEER'S REPORT.

Office of the Water Commissioners,
Jersey City, July 1st, 1861.

To the Board of Water Commissioners:

GENTLEMEN,—The following semi-annual report of the operations and condition of the works to July 1st, 1861, is respectfully submitted.

The annexed table marked "A," shows the work of the pumping engine, and the consumption of water for the past six months. The engine has worked 1,601 hours, delivering in that time 396,944,896 gallons of water into the receiving reservoir; average speed of engine, 8 strokes per minute.

The consumption of water has been 403,362,056 gallons; an increase of 15,936,154 gallons over the consumption of the previous six months.

The daily average use has been 2,216,500 gallons. The largest daily average appears during the month of January, 2,374,602 gallons, and the smallest in the month of March, 2,045,878 gallons.

PUMPING ENGINES.

The progress made in building the new engine at the date of the January report, led to the expectation of its completion during the month of May. The death of Mr. Birkbeck, the builder of the engine, which occurred in April last, has unfortunately delayed the work until the present time. One or two parts only of the engine now remain to be adjusted, and its completion may be looked for with certainty before the end of this month.

The present engine will then receive the examination and repairs so long needed, but which it has been impossible to give, by reason of the constant duty required from it.

ENGINE HOUSE.

The fitting up of the apartment occupied by the new engine has been proceeded with, and will be completed in a few days. An iron stairway to the cylinder floor has been put up, to give ready access to that portion of the machinery.

The exterior brick-work of the building continues to require the frequent replacing of crumbling bricks by others better adapted to stand the exposed situation of the edifice. A coating of mineral paint was applied during the last winter to a portion of the north wall, and its effect in stopping the disfigurement and injury to the building would warrant its being used over the whole exterior.

A tool or store room is now much needed, and should be commenced as soon as the new engine is finished.

RESERVOIRS.

The masonry and earth-work of both reservoirs are in good order, with no apparent leaks.

Estimates for rebuilding the gate-house of the receiving reservoir are now being received from builders, that it may be put in good condition before next winter.

The beams and flooring of the gate-house at the distributing reservoir are much decayed, and it would be advisable that iron should be used in replacing them.

The necessity for making provision for cleaning out the reservoirs at stated periods is very apparent, and should receive early attention. In the construction of the works, no arrangement to effect this, by dividing the reservoirs as is customary into two apartments, so that one could be kept filled for use while the other was cleaned out, was made. An arrangement whereby the Belleville Reservoir might be cleaned out when necessary could be effected, by connecting the rising main at one end of the reservoir with the effluent pipe, at the other by a 20 inch pipe about 900 feet in length; thus by shutting off the communication with the reservoir on each side when necessary, the water may be carried directly into the city or the distributing reservoir.

The cost of this connection would be $4,000.

PIPE BRIDGE AND BOX OVER THE HACKENSACK RIVER.

The recommendations contained in my last report, in regard to protecting this important portion of the work, by building ice breakers or cribs in the river, north of the bridge, having been favorably considered, proposals for doing this work, and also for replacing the present sunken parts of the pipe box with spans of wrought iron bridge, capable of conveying another main when laid, are now issued.

The guard wings of the drawbridge, have been rebuilt in the most substantial manner.

DISTRIBUTING PIPE.

The total amount of pipe laid since January 1st last, has been 3,888 feet, viz: 885 feet, 10-inch; 512 feet, 8-inch; 446 feet, 6-inch; 1,024 feet 4-inch; and 1,021 feet 3-inch; of these amounts, 3,003 feet are cast iron, and 885 feet wrought iron and cement pipe. The cast iron pipes now used, are coated with a preparation of coal tar varnish to protect them from rusting. Six fire Hydrants and three stop-cocks, (1, 6-inch, 1, 4-inch, and 1, 3-inch,) have been erected. The continuation of the 12-inch pipe in Newark avenue, near South 4th street, for a distance of 1,200 feet, to the westerly boundary line of Jersey City, and from thence through Newark and Bergen Wood avenues, Hudson City, to the Reservoir, would prove a desirable measure, in case of any accident or repairs to the present main, by which alone the city receives its supply.

A part of this 12-inch pipe is already laid in Hudson City from the Reservoir to the Five Corners, and from inquiries made, it is probable arrangements could be made with the Water Commissioners of that city to continue it to meet our pipe at the boundary line.

Table marked "B" herewith annexed, exhibits the amount of pipe laid, also the number hydrants and stop-cocks.

WORTHINGTON'S WATER METERS.

Until the month of January last, great difficulty existed in determining the amount of water supplied to steam-vessels at the wharves, and also in checking its wilful waste on the piers. Meters connected with the hydrants have since been placed on the principal coal-wharves, and water is now supplied to these vessels by the proprietors of the wharves, who make weekly payments for all the water consumed, as registered by the meter.

This plan has proved so entirely successful in properly regulating the use of water, and in avoiding all such sources of complaint, that 60 additional meters of different sizes have been provided for all ferries, railroads, foundries, and other establishments requiring more than an ordinary supply of water. A uniform rate of 1 cent per 100 gallons has been established by a resolution of the Board.

Table marked "C," shows the number and sizes of meters now in use and where applied. They are all of H. R. Worthington's patent—the trial of them since 1858, having proved them reliable and accurate.

The discovery, a few days since, of a leak in a pipe near the river, no indication of which existed on the surface of the ground, was made by the application of a meter, and a waste amounting in 24 hours to over 200,000 gallons of water was thereby stopped. The pipe alluded to passed over an old bulkhead, in part filled with stone, and by its settlement the pipe was broken, the water finding its way to the river through the openings of the stone work. Similar sources of leaks and waste will no doubt appear and be checked on the further application of meters.

SEWERS.

Since the last report, a main sewer has been commenced in South Seventh street, from Newark avenue to the east side of Prospect street, with its laterals.

The sewer is being constructed in strict conformity with the depths and other requirements of the general plan of sewerege.

A main sewer has also been built in Pavonia avenue, from Provost street to the bridge of the New York and Erie Railroad, by permission of the Common Council to the owners of lots fronting on that street.

A receiving basin and culvert has been placed on the southeast corner of York and Warren streets, and one at the northerly intersection of Newark avenue and South Sixth street.

An act allowing the construction of main sewers in each street running east and west where applied for by property owners, was presented to the Legislature at the last session, but failed io become a law far want of earlier attention. It is an important improvement to the sewerage plan, by reducing the length of the small lateral sewers, and giving them depth for drainage.

Nothing has been determined upon as yet towards providing means for flushing the sewers by the tide waters of the Mill Creek. The efficiency of the general system of sewerage in keeping these sewers in a clean and healthy condition is based upon this essential particular, and unless some plan of this kind is adopted, or the more expensive method of cleaning them out, by removing the deposites through the man-holes, is frequently resorted to, they must soon become injurious to public health.

A canal of about twelve feet in width now exists in Paterson street, neat the westerly boundary line of the city, excavated some years since by the estate of Coles, for drainage purposes, and receives the tide-water through the Mill Creek near the Erie Railroad bridge over that creek.

By cleaning out this canal, and connecting it through wooden trunks and conduits with the heads of the sewers in South Third, South Fifth, and South Seventh streets, the advantages to be derived from flushing may be at once obtained by a trifling expenditure.

Table marked "D," shows the deposites found to exist in the main sewers, built under the general plan of sewerage, from careful examinations lately made.

ROBERT C. BACOT,
Superintendent and Engineer.

Statement showing the quantity of Water pumped and consumed from January 1st, 1861, to July 1st, 1861.

YEAR.	MONTH.	Time Worked. HRS. MIN.	Strokes of Pump.	Gallons of Water. [231 cu. in.]	Lbs. coal pumping time.	Lbs. coal for keeping steam	Monthly consumption in Gallons.	Consumption per day.	Height of water in Distrib'g Reserv'r.
1861.	January.....	284 20	137,663	70,486,016	178,700	18,700	73,552,676	2,374,602	– 122. 2
	February....	246 30	119,746	61,309,952	157,300	16,000	64,354,952	2,219,136	– 121. 4
	March.....	256 15	125,061	64,031,232	155,100	18,600	63,422,232	2,045,878	+ 121. 6
	April.....	232 05	135,566	69,409,792	168,100	17,900	67,582,792	2,252,759	+ 122. –
	May	279 20	135,075	69,158,400	167,200	18,000	69,763,400	2,250,593	– 121.10
	June..	252 30	122,167	62,549,504	151,200	16,900	64,081,004	2,156,033	– 121. 8
		1,601 —	*775,283	396,944,896	977,600	106,100	403,362,056	Av. 2,216,500	

* 8.07 per minute.

Statement of the daily consumption of Water for the past 5½ years.

YEAR.	Average daily consumption.	Maximum daily consumption.
1856	581,000	900,000
1857	1,000,000	1,250,000
1858	1,425,000	1,700,000
1859	1,732,000	2,029,000
1860	2,076,000	2,238,000
1861 (six months)	2,216,000	2,374,600

Statement of the Annual Consumption of Water for the past 4 years.

July 1, 1857, to	July 1, 1858		516,472,876	gallons.
do. 1858, to	do.	1859	631,498,602	do.
do. 1859, to	do.	1860	733,627,969	do.
do. 1860, to	do.	1861	790,787,958	do.

Statement of the number and sizes of Water Meters now in use, and where applied in Jersey City, to July 1, 1861.

WHERE APPLIED.	SIZES. 3 in.	2 in.	1 in.	⅝ in.
New York & Erie Railroad, water tank and tow boats, ferry stations	2	1		
New York & Erie Railroad, old station	1			
Jersey City ferry slips	2	1		
New Jersey Railroad, engine house	1			
Do. do. depot	1			
Hudson Co. dry and wet dock		1		
Delaware L. & W. Railroad coal wharves	1			
Scranton Coal Co.'s wharves, J. B. Smith	1			
Randall & Morrell's coal wharves		1		
Colgate & Co.'s starch factory		1		
Hoffman & Curtis' distillery		1		
H. J. Baker & Co.'s oil factory			1	
Moore's oil factory			1	
Wm. Birkbeck's iron foundry			1	
Thomas Andrews' saleratus works			1	
Barrow's oil factory				1
McGraw & Co.'s planing mill				1
Howell & Birdsall's boiler shop				1
Knight & Crawford's cement works				1
Battelle & Renwick's chemical works				1
Heinrich, Somers & Co.'s oil works				1
John Rogers' oil works				1
Mrs. Newberry's laundry				1
Private dwellings (for testing consumption)				4
Jersey City locomotive works		1		1
David Kemp's foundry				1
J. L. Blackmore's foundry				1
Wallace's distillery			1	
J. H. Gautier & Co.'s crucible works				1
Colgate & Co.'s soap factory			1	
	9	7	6	16

Number of meters set..... 38
Do. do. on hand..... 36
Total..... 74

Water Commissioners of Jersey City.
J. R. WORTENDYKE, President.
EPHRAIM BRAY, DELOS E. CULVER,
BENJ. O. EDGE. J. B. ROMAR.

STEPHENSON'S SAFETY-LAMP.

It is generally supposed that the sole credit of the Miner's Safety-Lamp is due to Sir Humphrey Davy, by whose name it is sometimes called, but in a criticism of Smiles' Life of George Stephenson, the celebrated English Railway Engineer, we find an interesting tribute to his claim as at least a contemporaneous if not a prior inventor of that admirable safeguard.

The controversy regarding its priority of construction over that of the brilliant chemist,—a controversy into which Mr. Stephenson was unwillingly dragged, which affected his peace of mind for a season, and which led to a bitter feeling between the friends of the rival claimants,—is an interesting one. As also illustrating Mr. Stephenson's varied attainments, it fully deserves mention. There are few scenes so terrific as a colliery explosion. Sometimes at mid-day, when everything appears calm and bright, when the miners are engaged in their subterranean labors, and their families above are buisied with household duties, a sudden and awful cry of alarm carries terror to the hearts of hundreds, who rush from their dwellings in frantic haste as they learn that the mine is on fire.—Hurrying to the mouth of the pit, they may find the explosion so violent that the flames are driven up the shaft high into the air as from a volcano, and that all attempts for the rescue of the sufferers are vain, as no one can descend into the mine. Days, and sometimes weeks afterwards, when the fire is subdued, the charred bodies of the miners are brought to light, bearing witness of the fearful death they met, while their wives and children are cast upon the wide world without a protector. Such frightful casualties had made a deep impression on the minds of many benevolent persons,

and, among others, Stephenson determined to devise, if possible, some means of greater safety to the working miners. One day in the year 1814, a workman hurried into his cottage to tell him that the deepest main of the colliery was on fire. He immediately hastened to the mouth of the pit, and, in that energetic voice of command which instantly secures obedience, ordered the engineman to lower him down the shaft. Those who saw the brave man descend, and heard the cries of agony below from the miners, never expected again to see him alive. As soon as he was at the bottom, in the midst of the workmen, who were paralyzed with fright, he leaped from the bucket, and called out, "Stand back! Are there six men among you who have courage enough to follow me? If so, come, and we will put the fire out." The Killingworth men had learned to place the utmost confidence in Stephenson, and they instantly volunteered to follow him. Bricks, mortar, and tools, at hand in every mine, were quickly seized, and a wall was raised at the entrance of the main, so that the atmospheric air was excluded, the fire extinguished, and the miners and mine preserved. Stephenson at once set to work with his experiments on fire-damp; but before he could fairly introduce his safety-lamp to the public, his brilliant competitor attracted the notice of the whole scientific world by the invention to which his own fame at once gave celebrity, and bore away the honors justly due to the Killingworth engine-wright.

The chief object to be attained by any one who desired to prevent accidents from fire-damp, was to devise a lamp that should give sufficient light, without communicating flame to the inflammable gas, which frequently accumulated in certain parts of the pit. Many attempts had been made with little success. One of them consisted of a steel wheel made to revolve in contact with flint, and thus to throw off a succession of sparks; but the apparatus always required one person to work it, it gave out a feeble light, and was liable to explode. In 1813, Dr. Clanny, of Sunderland, invented a lamp, which he supplied with air through water by means of a bellows, and which went out of itself in inflammable gas. It was found, however, too unwieldy to be used by the miners. A committee of gentlemen was formed at Sunderland, to investigate the cause of explosions, and at their suggestion Sir Humphrey Davy, then at the meridian of his fame, agreed to turn his attention to the matter. For this purpose he visited the collieries near Newcastle, on August 24th, 1815, and on the 9th of November of the same year he read his celebrated paper "On the Fire-Damp of Coal Mines, and on Methods of Lighting the Mine so as to prevent its Explosion," before the Royal Society of London. It at once gave additional lustre to the brilliancy of his reputation, and was universally hailed as a splendid triumph of science. Here was a chemist who by experiment on a few phials of fire-damp, brought hundreds of miles from its mine, discovered that it would not burn through tubes of a certain diameter, although atmospheric air freely passed through them, and, proceeding to multiply while he shortened the tubes, finally ascertained that an enclosure of wire-work was indeed but an aggregation of tubes, admitting the necessary air, excluding the fire-damp, and giving all the lamp required, and that the principle thus established in the laboratory of the Royal Institution would hold good in any colliery in the universe. Seldom, indeed, in so short a time, has the philosopher been rewarded by such a brilliant discovery. Sir Humphrey was hailed as a genius of almost superhuman intuition, and "the Davy" very shortly came into general use.

But what had George Stephenson been doing all this time? For several years before the attention of Sir Humphrey had been called to the matter, he was making experiments with fire-damp in the Killingworth mine itself, at the risk of his life. Many years afterwards, when examined by a committee of the House of Commons, which sat on the subject of accidents in mines, he detailed the experiments connected with fire-damp which led him to the construction of his safety-lamp, and we give his own words:

"I will give the committee," said he, "my idea mechanically, because I knew nothing of chemistry at the time. Seeing the gas lighted up,* and observing the velocity with which the flame passed along the roof, my attention was drawn to the contriving of a lamp, seeing it required a given time to pass over a given distance. My idea of making a lamp was entirely on mechanical principles; and I think I shall be found entirely correct in my views, from mechanical reasoning. I knew well that the heated air from the fire drove round a smoke-jack, and that caused me to know that I could have a power from it. I also knew very well that a steam-engine chimney was built for the purpose of causing a strong current of air through the fire. Having these facts before me, and knowing the properties of heated air, I amused myself with lighting one of the blowers in the neighborhood of where I had to erect machinery. I had it on fire; the volume of flame was coming out the size of my two hands, but not so large but that I could approach close to it. Holding my candle to the windward of the flame, I observed that it changed its color. I then got two candles, and again placed them to the windward of the flame; it changed color still more, and became duller. I got a number of candles, and placing them all to the windward, the blower ceased to burn. This then gave me the idea, that if I could construct my lamp so as, with a chimney at the top, to cause a current, it would never fire at the top of the chimney; and by seeing the velocity with which the ignited fire-damp passed along the roof, I considered that, if I could produce a current through tubes in a lamp equal to the current I saw passing along the roof, I should make a lamp that could be taken into an explosive mixture without exploding externally."

On such a theory, Mr. Stephenson proceeded to embody his idea in a practical form, and in August, 1815, he requested his friend, Mr. Wood, the head viewer of the colliery, to make a drawing of the lamp according to his suggestions. This was done, and the lamp was constructed from the plan by Messrs. Hogg, tinmen, in Newcastle. On the 21st of October it was received from the makers, and taken to Killingworth for trial on the same day. Stephenson, with two or three friends, at once went down into the mine. They soon found where the fire-damp was, and his companions declined going further.

"Apprehensive of danger, they retired into a safe place, out of sight of the lamp, which gradually disappeared with its bearer, in the recesses of the mine. It was a critical moment; and the danger was such as would have tried the stoutest heart. Stephenson, advancing alone, with his yet untried lamp, in the depths of those underground workings,—calmly venturing his own life in the determination to discover a mode by which the lives of many might be saved and death disarmed in these fatal caverns,—presented an example of intrepid nerve and manly courage, more noble even than that which, in the excitement of the battle and the collective impetuosity of a charge, carries a man up to the cannon's mouth. Advancing to the place of danger, and entering within the fouled air, his lighted lamp in hand, Stephenson held it firmly out, in the full current of the blower, and within a few inches of its mouth! Thus, exposed, the flame of the lamp at first increased, and then flickered and went out; but there was no explosion of the gas. Stephenson returned to his companions, who were still at a distance, and told them what had occurred. Having now acquired somewhat more confidence, they advanced with him to a point from which they could observe him repeat his experiment,—but still at a safe distance. They saw that when the lighted lamp was held within the explosive mixture, there was a great flame; the lamp was almost full of fire; and then it smothered out. Again returning to his companions, he relighted the lamp, and repeated the experiment. This he did several times, with the same result. At length Wood and Moodie ventured to advance close to the foul part of the pit; and, in making some of the latter trials, Mr. Wood himself held up the lighted lamp to the blower. Such was the result of the first experiments with the *first practical Miner's Safety-Lamp;* and such the daring resolution of its inventor in testing its valuable qualities."

It should be borne in mind, that this trial of the lamp was made on the 21st of October, 1815, and that Sir Humphrey Davy did not read his paper to the Royal Society until the 9th of November following. But when Mr. Stephenson's friends attempted to substantiate his claim to priority of invention, they were met with a shout of indignation and derision. What chance, indeed, had the humble engine-wright, as yet scarce heard of half a mile from home, except to a few such gentlemen as the Earls of Ravensworth and Strathmore, in competition with the brilliant Davy, whose discoveries had astonished all Europe, the courted of London drawing-rooms, whose lectures attracted the most aristocratic peeresses of the realm, and were attended by Coleridge that their eloquence might "increase his stock of metaphors"? In many points the controversy between the two inventors bears resemblance to the famous one of Newton and Leibnitz as to the Differential and Integral Calculus, or to that of latter times regarding the discovery of the planet Neptune by Adams and Le Verrier; as, in both these instances, the merits of one discoverer did not derogate in the least from that of the other. Sir Humphrey Davy had never heard Stephenson's name, and no doubt felt himself very justly annoyed at having his invention claimed, regarding it, as he naturally might, as one of his greatest scientific triumphs. Mr. Stephenson probably did know that Sir Humphrey was experimenting, though in what way he was of course ignorant; but when the Davy lamp was first exhibited to the coal-miners at Newcastle, some of them exclaimed, "Why, it is the same as Stephenson's." The two men had struck upon the same idea hundreds of miles apart, Davy scientifically, Stephenson mechanically; but no degree of acrimonious zeal in the partisans of either could ever elicit the slightest proof that they had not independently arrived at the same safety-lamp, and were in consequence equally deserving of the honor. But Stephenson did invent his lamp before Sir Humphrey Davy produced his, as may be shown by irrefragable testimony, and therefore he in his turn felt aggrieved when, at a meeting of coal-miners and others, resolutions were passed in honor of the chemist, not for "the invention of *his* safety-lamp," as at first drafted, but for "his invention of *the* safety-lamp." This was giving the whole honor to Sir Humphrey Davy, and allowing Mr. Stephenson none; and accordingly the friends of the latter gentleman proceeded to assert his claims as the original inventor. They were outvoted, however, and the sum of £2,000 was raised to be presented to Sir Humphrey, £100 being assigned at the same time to Mr. Stephenson. This being very unsatisfactory to the inventor as well as to his partisans, a subscription was commenced in 1817, and a committee formed by the Earl of Strathmore, Mr. Brandling, and other influential gentlemen, for the purpose of presenting Mr. Stephenson with some adequate testimonial. The list was headed by the Earl of Ravensworth with one hundred guineas, and on the 18th of January, 1818, the handsome sum of £1,000 and a silver tankard were presented at a public dinner in the assembly-rooms at Newcastle. This was no more than Mr. Stephenson's due; but what said Sir Humphrey Davy when he heard of the matter? He characterized the proceedings as "infamous," accused Stephenson of having "pirated" his invention, and denounced the engine-wright's own invention as "a gross imposture." Davy was the spoiled child of success and fashion; he displayed ill-temper and a pretentious hauteur to rivals on more than one occasion, and was quite wanting in that generosity which should accompany true greatness. Forty years and more have elapsed since the invention of the lamps and the controversy to which they gave rise; all bitterness of feeling has long since passed away, and we should not have recurred to the dispute, but from a sincere desire to place the claims of Mr. Stephenson in a proper light. It should be remarked, that, although his lamp never came into general use, as Sir Humphrey's did, yet it is still employed, and in extreme danger regarded as the safer of the two; for where "the Davy" in excessive fire-damp explodes, "the Geordy" lamp is extinguished.

* In order to make his experiments, he would set fire to the gas in the mine as it blew out of the fissure.

Rio de Janeiro, S. A.—This company made 106,000,000 c. f. of gas in 1860.—The meters are all wet, owned by the consumers, of whom there are 5,500. They supply 4,800 public lamps at $50 per annum each; sell their coal tar; use Wigan cannel only; sell the coke at $12 per ton, and their stock is at sixty per cent. premium.

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LIGHT, HEAT, WATER-SUPPLY AND SEWERAGE.

Its purpose is to ascertain and make known all new discoveries in the science and economical application of LIGHT, and promote thereby the interests of companies and consumers; to encourage and aid the introduction of PURE WATER from Lakes and Rivers into Towns and Cities, and to improve the system of SEWERAGE, VENTILATION, HEATING, and DRAINAGE everywhere.

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THE

AMERICAN GAS-LIGHT JOURNAL,

PUBLISHED ON 1ST AND 15TH OF EVERY MONTH.

PROPRIETOR, JOHN B. MURRAY. } { EDITOR, C. ELTON BUCK.

FRIDAY, NOVEMBER 15, 1861.

On page 88 we noticed the appointment by the British Government of a commission to inquire into the efficacy of the light-house system as now conducted, and to suggest any means of illumination, whereby the lights might be made more capable of penetrating to a greater distance, and of performing a more valuable service than the old oil-lamps. The innovations which have been made in artificial light in public and private buildings, and the economy which has invariably followed these changes, render it desirable that a like improvement should be effected in light-house illumination; while the increase of commercial enterprise multiplying the number of vessels engaged in traffic imperatively demands a greater security for life and property from the perils of navigation, than the old *regime* affords. Hence the motives which actuated the authorities in this movement, which we hope will result in a radical change, and the substitution of more improved means of illuminating light-houses than the former system, which, having performed a good work in its day, must eventually give way to such methods as are dictated by a growing application of the laws of science.

In the large volumns which resulted from the labors of the commissioners, a number of suggestions are made which give evidence of a thorough comprehension of the subject, and an earnest desire to accomplish a reform. The opinions of the distinguished *savans* forming the commission are entitled to great weight, and will doubtless give an impetus to the realization of some plan, for introducing a more approved agent than the oils heretofore used. Although a large majority of the authorities consulted were extremely conservative in their opinions, and inclined to the belief that the use of the oil-lamp is the most satisfactory, particularly in certain places where local objections would militate against the use of other substances, yet a large number favor the employment of different illuminators. Among these may be mentioned the lime light, the various modifications of the electric light, the Bude light, the FITZMAURICE light, gas-light fed with pure oxygen, oxygen in conjunction with an oil-lamp, and paraffine oil. Lord ROSSE advocates the lime light, as being, in his judgment, superior to all others, in which view he is supported by eminent authorities. As was mentioned on page 133, the lime light is now being tried at the South Foreland light-house, in the county of Kent, England, one of the most celebrated light-houses in the Kingdom, where, from its importance to the mariner, its operation will be undoubtedly watched with great interest. From the commanding position of this location, it will afford an excellent opportunity of fully testing the innovation, and it will not take a long time to decide as to its merits.

In order to obtain the oxygen gas for this light the method of generating it by heat from sulphuric acid is recommended as originally proposed by MM. ST. CLAIR DEVILLE and H. DEBRAY, whose process will be found detailed on page 42 of this vol. Coal-gas and oil-gas are recommended as substitutes for hydrogen in the lime light, and if it be inconvenient or impossible to produce them on the spot, it is suggested that they be obtained elsewhere compressed in strong metallic receivers, and transported to the place of consumption. That this plan is feasible is proved by the use of gas in our railway cars, which is stored beneath the floors of the cars in vessels capable of sustaining a pressure of 600 lbs. to the square inch, and is always ready for immediate use, but whether it could be depended upon with absolute certainty is altogether another matter. In light-house illumination it will not do to use any method which could fail in the event of any unexpected contingency. The mariner should feel an unlimited confidence in each light, and be so well assured of its regular unceasing existence as to place the most implicit confidence in its always warning him against the dangers to which he is exposed. It remains, therefore, that the matter of the continuity of supply of the gases be fully demonstrated, before a favorable judgment can be expressed of this innovation. Should any unforeseen event occur, by which the supply would be interrupted, the most disastrous consequences might ensue. Such an occurrence would retard all progress, and induce a return to the old system.

A number of the commissioners favor the electric light. Various modes of producing this light have been recommended. The first English patent with which we are acquainted for generating light by electricity is that of STAITE, obtained in 1846. In 1848 he obtained another patent for alleged improvements in his apparatus. In the same year LEMOLT also took out a patent for improvements in apparatus for obtaining the electric light. In the following year a patent for a similar purpose was granted to PEARCE, and shortly after that, one to STAITE and PETRIE. A number of modifications have been recommended since then, among which the more prominent are those of WAY, HOLMES, and WATSON. Prof. WAY's apparatus has been tried with some degree of success in the South Foreland light-house, and also in other places where remarkable effects were noticed. It is unquestionable that an intense flood of luminous rays is emitted by the electric light, but as regards its practical application, there seems to be a difficulty to contend with at the outset, in the management of the apparatus, and in the delicate manipulation required to take a proper care of the batteries and the various parts of the instrument. It might thus be open to the objection of being liable to interruptions, which would be fatal to its success. It is also to be apprehended that the expense attending the use of the electric light will retard, if not wholly preclude its adoption.

The Bude light is recommended by Mr. MACKINTOSH. This light was invented by GURNEY, who called it after his native place, Bude, a small village in Cornwall. This light, as originally constructed by its inventor, consisted in coal-gas burned in an Argand burner, fed with pure oxygen gas, whereby the brilliancy of the flame was much heightened. The Bude light as now known consists of a gas-flame with several concentric burners, with chimnies supplied with atmospheric air, and a reflecting apparatus of peculiar construction.

Sir DAVID BREWSTER, one of the most eminent authorities consulted, and whose researches on light are well known to the scientific world, recommends the use of coal-gas, fed with pure oxygen. A light of this description bears a strong resemblance in its essential particulars to the original Bude light, and would require the same apparatus for generating and storing two the gases. In some localities, situated at a remote distance from land, such as the Eddystone light-house for example, it would be impracticable, or at least extremely difficult to use gas-light in any form. In such places it seems probable that the oil-lamp alone will continue to be employed, with such improved modifications in mechanical appliances as may be suggested.

Among other suggestions made to the commissioners, was the use of pyrotechnic mixtures, which can be made to combine great vividness of flame with an extended surface of exposure. But when it is taken into consideration that this light must be generated within the enclosure of the lantern, the difficulties attending their use will be apparent. The fumes and sublimates which would result from the combustion of such mixtures, would counteract all the beneficial effects of the intensity of light, and would prove an effectual barrier against their adoption.

In considering a subject of so great importance as the best means of improving light-house illumination, it is necessary to take a wide view of the field, which presents many different points. Under the different circumstances of the various locations, it is plain that one plan of reform will not do for all, and that there are certain places where an adherence to oil-lamps will be rendered necessary. Whether fish or animal oils will not be eventually superseded by coal-oils in such places, remains to be seen. In other localities, easy of access, we are inclined to believe that coal-gas will be adopted, and that the many advantages which have accrued from its use elsewhere, will be fully realized. Whether it will be well to use the gas in conjunction with oxygen, or simply alone, will be determined better by experiments than by conjecture, and this subject having been brought into such prominent notice, will receive due attention from those most interested in its details. The final conclusion of the authorities having the control of the light-houses will be looked for with great interest, and, as above mentioned, we are not without hope that gas-light will be proved to be best suited to the purpose, in all the essential particulars of safety, cleanliness, and economy.

GAS-LIGHTS IN THEATRES.

On page 121 of this volume, we noticed some improvements in lighting theatres, which had been introduced lately in Paris, and we urged the importance of a reform among ourselves, from motives of humanity as well as other considerations. Since that time our opinions of the present dangerous manner of placing gas-lights have received an emphatic endorsement in the appalling accident which occurred a few weeks ago at the Continental Theatre in Philadelphia. Our readers generally are familiar with the particulars of that catastrophe. During the performance of SHAKESPEARE'S *Tempest*, while the ballet-girls were dressing in their apartment, one of their dresses, while being taken from the place where it had been hanging, came in contact with a gas-light. The thin fabric became instantly ignited, communicating the fire to the other dancers, who were nearly ready for the stage, attired in thin gauze, which took fire with great rapidity, subjecting the poor creatures to the most exquisite agony. The number of the victims of this calamity was fourteen, nine of whom have died, and the remainder will, by their scarred and maimed features, present lasting evidence of the horrors through which they passed. The coroner's jury entirely exonerated the proprietor of the theatre from censure, the gas-lights being in as safe a position as is usual in such buildings.

This fearful occurrence should be a warning to proprietors of similar establishments to render, by a proper disposition of the lights, a similar accident

impossible. The lights on the stage, at the "flies," and in the dressing-rooms, should be Argand burners, which are comparatively safe owing to the protection afforded by the chimney, and these should be surrounded by a screen of wire. So long as the present position of the lights is maintained, the authorities should see that this practice be enforced. But a still better arrangement would be to place the lights out of reach, *above* the stage, as we suggested in the article referred to, where the addition of mirrors might compensate for the distance the luminous rays would have to be projected. This subject should receive the earnest attention of managers, whose interests, as well as the safety of their employees, are involved in it.

EXTRAORDINARY RESULTS FROM WATER-METERS.

The attention of the officers of water-works is directed to the interesting report of the Board of Commissioners of the Jersey City, N. J., Water-Works, published to-day, in which the results from the adoption of water-meters are stated at length.

The most important and striking fact is disclosed by Mr. Bacot, the engineer, in relation to the discovery of a leak in one of the mains, the precise location of which could not be determined until a meter had been applied in the vicinity, when *a waste of two hundred thousand gallons per twenty-four hours, was stopped.* By the application of meters at all the large factories and steamboat services, *the reservoir is actually gaining on the water-line, although the paying consumption is increasing.* Why? Because there is no waste.

How much more sensible is this plan than expending one or two hundred thousand dollars on another reservoir, and when will the chief engineer of the Croton Aqueduct Department consent to learn this?

A committee of the water commissioners of Boston, Mass., have been here within a few days, and ordered a supply of meters for their heavy customers. They have found out that five or ten thousand dollars' worth of meters is a better investment than half a million dollars' worth of reservoirs, if even in but one view, that it teaches people to be saving of one of the greatest earthly blessings—pure water.

That a cheaper meter is wanted is admitted on all sides, and by none more freely than Mr. Worthington, who will probably set his inventive genius at work in devising one, or, if he does not, somebody else will.

Mr. Bowditch's Purifying Processes.—The purification of gas by means of clay, proposed by Rev. W. R. Bowditch, has not given satisfactory results; but the employment of heated lime, proposed by the same inventor, has been submitted to experiments, which have demonstrated its efficacy. Thus on heating the lime in the purifiers to 140° or 160° centigrade (244° or 360° Fahrenheit), and slowly passing a current of gas through it, the bisulphate of carbon is arrested. It remains to be seen whether this means of purification is practicable, and this is a question which experiments have not yet determined.—*Journal de l'Eclairage au Gaz.*

[The above opinion of our French cotemporary on the clay purifying process of Mr. Bowditch accords with our own, and those previously expressed in the *Journal of Gas-Lighting.* Wherever impartially tried, it has proved a failure, and yet the inventor with great effrontery continues to insist on its efficacy, and, notwithstanding his frequent discomfitures, asserts it to be the only means of arresting bisulphide of carbon.—[Ed.

To Iron Founders.—The attention of iron founders is called to the two advertisements of the Jersey City Water-Works in this number, inviting proposals for water-mains.

THE NATIONAL LOAN.

The undersigned is prepared to supply

7 3-10 TREASURY NOTES

in bills of $50, $100, $500, and $1,000, with coupons attached, at par, with interest at two cents per day from August 19, 1857, on every $100.

Certified Bank checks, current Bank notes, and Two-year six per cent. Treasury notes received in payment.

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and remitted in drafts payable at every Bank in the United States.

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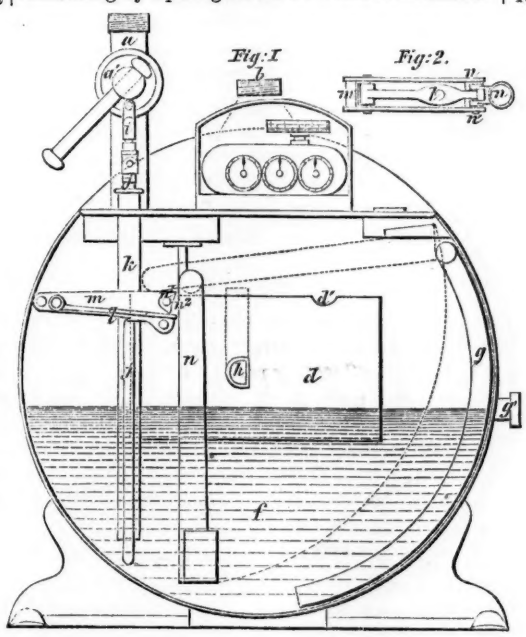
against the WAR and NAVY Departments cashed, and deferred claims collected in Washington.

JOHN B. MURRAY,
Banker,
No. 39 Nassau at., New York.

LIZARS' IMPROVED GAS-METER.

An improved wet gas-meter has been patented in England by Charles Lizars, of Paris, France, in which the water is continuously supplied to the measuring compartment, and always maintained at a working level by means of the cock by which the gas is turned on and off. In the accompanying illustration, a meter, partly in section is exhibited, arranged according to this invention in figure 1. The inlet is represented by *a*, the outlet pipe by *b*. *d* is the outer chamber, communicating by a passage around the axis of the measuring drum with the chamber containing the same, the water completely covering this passage. The axis of the rotary drum drives clock-work apparatus as in ordinary meters. *f* is the water reservoir; *g* the overflow pipe, by which, when the meter is filled, the excess of water is allowed to escape, by the removal of the stop-screw *g'*; *h* is a pipe for the passage of the gas from the reservoir *f*, (which it enters by the pipe *a*,) to the interior of the measuring drum; the pipe *h* passes entirely through the outer chamber *d*. On the inlet pipe *a*, is the cock *a'*, which turns the gas on and off. The rod *j* is connected to this cock by a link *i*, and descends into the reservoir *f* through the pipe *k* sealed at the bottom by the water in the reservoir; after passing out at the bottom of the pipe *k*, the rod *j* is bent upwards, and rests against the under part of the lever *l*. Figure 2 shows the plan of the frame *m* which is attached to the meter, *n* is the scoop, centered at *n'* to the frame *m*. The end of the lever *l* enters under a projection n^2 on the under part of the scoop *n*, so that when the lever *l* is moved up by turning the cock *a'*, it causes the scoop to assume the position shown by the dotted lines in fig. 1.



The scoop *n* is a pipe opened near its lower end on its right-hand side, and as it is raised, it lifts a quantity of water from the reservoir *f*. This water escapes at the other end of the scoop, and falls into the chamber *d*, the end of the scoop being bent to direct it into the chamber. Any excess of water raised, flows out of the chamber *d*, over the notch *d'*, and falls back again into the reservoir. The lever *m* may have a curved rack formed at its end, and this may be made to gear with a pinion on the axle of the scoop *n*, so as to produce a similar motion should this arragement be preferred.

ANSWERS TO CORRESPONDENTS.

A. P. T., of N. Y.—*There is but one gas-light company in the State of Arkansas—that at Little Rock.*

C. A. B., of Pa.—*There is nothing new in the views you take, or in the arguments you use to sustain them. We cannot open our columns to a discussion which is "flat, stale, and unprofitable," as our space is too valuable to be thus wasted.*

J. E., of Mass.—*Our last number gives the number of gas-works in the rebel States and their aggregate capital. You will find it on page* 138.

F. E. Y., of N. B.—*We cannot answer your question immediately, as the figures must be hunted up. When we obtain the results, we will notify you by mail.*

D. L. P., of N. J.—*The price of gas in Pittsburg, Pa., is* $1 50 *per thousand cubic feet. This is a lower price than that charged anywhere else in America.*

J. B. J., of Ohio.—*Hydrogen gas conducts both heat and electricity better than any other gas, resembling the metals in this respect.*

CORRESPONDENCE.

The Jamestown, N. Y., Gas-Light Co.
Jamestown, Nov. 11, 1861.

To the Editor of the American Gas-Light Journal:

We lit up on 15th October. Will have over one hundred consumers this fall. The fitters are all hard at work fitting up buildings. All went off well at lighting up. Gas is first quality. Coal from Erie, Pa. Beaver and Mt. Carbon, half and half. Clay retorts from Gautier's. Starr's holder and pipe—two miles laid. Down & Merrifield's meters, &c., &c. Lead joints, of course.

Resp'y yours.,
F. A. Sabbaton.

CLAY RETORTS IN GERMANY.

Of one hundred and thirty-seven gas-works in Germany using clay retorts, sixty employ the Belgian retort made by Keller, of Ghent; thirty, those of Oest, of Berlin; six, those of Boucher, of St. Ghislain; six, those of Cowan & Co., of Newcastle, England; five, those of Foorbach, of Mulheim, and others of different makers.

The number of clay retorts in a bench is from one to seven; but a bench of three, five, or seven is the most general.

As to the form of the retorts, nineteen works have pronounced for the oval; fifty for the ⏢ shape, and the others have declared that each form has its particular advantages. Several reasons are given in favor of the oval retorts, which are principally employed in large works. Some pretend that the bottom of the ⏢ shaped retorts, is deteriorated more rapidly than that of the others; and the partizans of the divers forms incline to the opinion that this same difference facilitates a more perfect arrangement in the furnace.

The dimensions of the retorts are different, and vary from 15 to 25 inches in width; 12 to 18 inches in height; 7 to 9½ feet long; and 2 to 3 inches in thickness.

One shape which appears satisfactory to all requirements, consists in giving an elliptical form to the lower part of the retort, convex walls at the sides, and an arch composed of a semi-circle at the top.

In regard to interior and exterior smoothness of surface, St. Ghislain, Duysbourg, and Ghent, have obtained the premium, from which it may be concluded that the retorts of English and German manufacture have not yet attained the same degree of perfection.

Some engineers of gas-works employ intermediate supports in setting their retorts. Others support them only front and back. Some place them immediately on the foundation wall of the furnace; others remove a few inches of this. It is difficult to say which is the best of these methods, and the care exercised by the masons in their work, the choice of materials and their good quality, always exercise the greatest influence on economical results which it is wished to attain.—*Journal de l'Eclairage au Gaz.*

REPORTS OF GAS INSPECTORS.

BALTIMORE, MD.

For the week ending October 24, 1861.

Illuminating power, in Candles.	Sulphur, grs. in 100 cubic feet.	Ammoniacal Gas.	Sulphuretted Hydrogen Gas.	Carbonic Acid Gas.	Pressure in Main, Maximum.	Pressure in Main, Minimum.	Burning pressure during trial of Gas.	Bromine condensation per cent.
15.5	less than 5 grains.	In excess.	none	none	4 0/10	1 8/10	2/10	4.9

WILLIAM E. A. AIKIN,
Inspector of Illuminating Gas.

REMARKS.

The President of one of our American gas companies says: "The fishtail burner" (the one in most common use) "is best adapted for general use, and will afford "the best results; but the rapid flow of gas must be "checked so that it passes from the burner at a low "pressure—from 3-10 to 6-10 is the best pressure for "these burners. When the gas passes with greater "velocity under a high pressure the illuminating pow-"er of the light is diminished. The velocity may be "increased until the whole flame becomes blue."

For the week ending October 31, 1861.

Illuminating power, in Candles.	Sulphur, grs. in 100 cubic feet.	Ammoniacal Gas.	Sulphuretted Hy. rogen G. s.	Carbonic Acid Gas.	Pressure in Main, Maximum.	Pressure in Main, Minimum.	Burning pressure during trial of Gas.	Bromine condensation per cent.
15.4	less than 5 grains.	In excess.	none	none	3 4/10	1 4/10	2/10	4.9

WILLIAM E. A. AIKIN,
Inspector of Illuminating Gas.

REMARKS.

The gas has been remarkably good during the past week, and has been distributed under a much more moderate pressure.

For the week ending November 7, 1861.

Illumi nating power, in Candles.	Sulphur, grs. in 100 cubic feet.	Ammoniacal Gas.	Sulphuretted Hydrogen Gas.	Carbonic Acid Gas.	Pressure in Main, Maximum.	Pressure in Main, Minimum.	Burning pressure during trial of Gas.	Bromine condensat on per cent.
16.	less than 5 grains.	In excess.	none	none	3 4/10	1 7/10	2/10	5.

WILLIAM E. A. AIKIN,
Inspector of Illuminating Gas.

REMARKS.

The most remarkable fact noted during this week has been the wide range of illuminating power, rising at one time to 18.2 candles, and going down a few days later to 13.9 candles, where it now stands.

REPORTS OF GAS-LIGHT COMPANIES.

FIFTH WARD, MILWAUKEE, WIS.

For the year ending April 1st, 1861.

We are at length enabled to present a report of this concern's affairs after more than two years efforts to obtain it. It is the opposition gas-works at Milwaukee, Wis., a one-horse affair at best, and is being gradually absorbed by the regular works of the place. It will soon be no more.

Coal on hand 1st Apr. '60	102^{0000}	
" purchased	250^{1414}	
		352^{1414}
" used Furnaces	$14^{1\cdot50}$	
" carbonized	293^{1245}	
		308^{0395}
Coal on hand 1st Apr. '61		44^{1019}
Gas manufactured per Station Meter		2,104,700
" to private consumers		1,082,900
" " street-lamps		716,963
		1,749,863
Condensation and loss, about 16 6-7 per ct.		354,837

RECEIPTS.

Rec'd for gas to private consumers	3,603 66
" " street-lamps	1,792 31
" meter rents	471 62
" rent of lamp-posts	257 50
" lighting and extinguishing	257 50
" tar sold	84 33
Total	$6,466 92
Net loss	333 11
	$6,800 00

EXPENSES.

Wages of men at Works		1,566 50
Lime for purifying		99 25
308^{395} tons coal used in manufacture		1,391 51
One year's interest on bonds		2,800 00
Interest on notes discounted		20 83
Expense ac. as follows:		
Old taxes since 1856	317 18	
This year's taxes	42 64	
Extension of mains to M. E. Church	70 84	
Highwines for meters, &c	67 16	
Repairs, including two new retorts	153 36	
Incidental expenses	80 16	
Meters, meter cocks, unions, freight, &c	109 20	
Extra labor	22 00	
Fire-brick clay and tile	59 40	
		921 94
		$6,800 03

PROFIT AND LOSS.

Dr.

Balance of ac. Apr. 1st, '60	2,628 60
Dis. on $2,182 63, city orders	545 36
Unpaid gas-bills, ($5 25, consumers; 55c. city,)	5 80
Net loss this year	333 11
Balance 1st Apr. 1861	$3,512 87

ASSETS AND LIABILITIES.

Capital stock issued	41,850 00
Mortgage bonds	35,000 00
	$76,850 00
Deduct construction ac	74,767 00
Balance construction *Dr.* to capital stock	2,083 00
Bills payable	3,012 50
M. E. Church, (advance to be paid in gas,)	64 00
Coupons unpaid	160 00
Total liabilities	$5,319 50
In treasury, (city orders, $667 80; cash, $10 89,)	678 69
44^{1019} tons coal on hand—cost	201 23
Due from city of Milwaukee, (Feby. and Mch.,)	398 81
Bills receivable	52 90
Due from sundry persons on stock	415 00
" Wm. J. Bell & Co	60 00
Total assets	$1,806 63
Balance from Profit and Loss ac. to bal.	3,512 87
	$5,319 50

TREASURER'S ACCOUNT.

Dr.

Balance, April 1st, 1860	$608 98
Receipts from private consumers.	4,072 28
" for tar sold	84 33
City orders received	2,983 76
Proceeds of $300 note dis. Feb'y 12, '61, 30 ds	297 25
" $700 " April 5, '61, 90 ds	681 92
Bills Receivable, Owen Kelly's note paid	100 00
Cash advanced by M. E. Church	64 00
	$8,892 52

Cr.

By Wages of men at works	$1,566 50
" Lime for purifying	99 25
" Sundry coal bills	409 81
" Paid coal note at Bank Mil	921 79
" " coupons	2,720 00
" Discount on city orders	545 36
" Paid coal note to Wm. H. Keith	723 93
" " note of $300, dis. Feb'y 12, '60	300 00
" Unpaid gas bills previously charged	5 25
" Expense ac	921 94
	$8,213 83
Balance April 1st, 1861	678 69
	$8,892 52

Milwaukee, April 15th, 1861.

BURNING OIL WELLS.—An oil well on fire is thus described in the *Titusville* (Pennsylvania) *Gazette*:—"A dense black cloud of smoke was distinctly to be seen as the hill-tops were reached on leaving town. That cloud increased as the well was neared, until seen from the top of the hills adjoining the valley where the well was located, when the black column of smoke appeared, up which angry and lurid flames could be seen constantly leaping and flapping about, as though endeavoring to lash themselves into greater fury. The flames rose sixty to eighty feet into the air, and the noise of the flame, and the oil, and gas rushing from the pipe were distinctly heard three-fourths of a mile. The stream of oil, the full size of the pipe, (four inches in diameter,) was thrown fifteen to thirty feet high, and all on fire the instant it left the pipe. Drops of oil thrown off were a lurid blaze, and drops of water, converted into steam, were flying in every direction. Spiral columns of flame, formed by currents of air, rose on every side, and in great fury, presenting most unique spectacle. The scene was grand, and one long to be remembered."

FOREIGN NEWS.

RECENT ENGLISH PATENTS.

A patent has been recently granted to Joseph Jacob, of Brünn, Austria, but at present residing in London, for "*Improvements in the mode of and apparatus for, obtaining gas, and the application thereof for domestic, manufacturing, and other purposes.*" This is another water-gas patent, relating to methods of producing and employing pure hydrogen gas, in a manner that will enable it to be used economically for heating, lighting, or manufacturing purposes.

One method of producing this gas, (which has been hitherto only demonstrated in the laboratory,) consists in passing steam through a pipe or tube, which contains small quantities of iron in the form of borings or filings. In order to produce the hydrogen gas in large quantities, and at a comparatively trifling cost, so as to make it available for commercial purposes, steam is generated in a steam-boiler of the ordinary, or any other suitable construction, and is caused to pass through a series of retorts, each containing the requisite quantity of iron in the shape of turnings, borings, filings, or of iron crushed, ground, or otherwise reduced to powder, and heated to a red heat, it being essential to the successful working of the process that the iron should be in a finely divided state, so as to present a large surface to be acted upon by the steam. After the steam has been decomposed, the liberated hydrogen gas is conducted by pipes into a receiver or holder of the requisite dimensions, to be from thence distributed as occasion may require. Or, instead of the steam being caused to enter into the first of the series of the retorts, and the gas generated therefrom being passed through the whole series, consisting of two or more retorts connected together by connecting pipes or joints, steam may be passed into each separate retort, and the gas generated may be passed directly into pipes leading into a gas-holder. Both the retorts and the boiler may be so constructed, and placed so as to be heated from a common furnace or fire-place or different ones. After a sufficient supply of hydrogen gas has once been produced, it is intended to use the same both under the retorts, and under the steam-boilers in place of, or together with other kinds of fuel. The iron, in proportion as it becomes oxidized by the absorption of the oxygen from the steam, loses its power of assisting in the production of the hydrogen gas, and when oxidized to a certain extent, it is discharged from the retorts, which are then filled, or charged with the necessary quantity of new iron in its metallic state.

The retorts may be similar in construction to those used in making the ordinary coal-gas for illuminating, with the exception of the steam-pipe, which is fitted or attached to the retort at or near one end of the same, or ordinary iron pipes may be used fitted with suitable ends. When the iron is to be discharged, the ends of the retorts, or parts of the ends, are taken off, and the iron is raked or pushed out. For the filling of the retorts, a scoop of sheet iron, of about the length of the retort, is filled with iron, introduced into the retort, and discharged it by turning round upon its axis. The scoop is then withdrawn, and the ends secured to the retort, when the latter will be ready for operation.

The hydrogen gas obtained as above described, may be employed either in a pure state, or mixed with air under atmospheric pressure, for a great variety of purposes, such as the heating of stoves for warming apartments, or cooking-stoves and boilers, and for other domestic purposes. For the heating of the various descriptions of steam-boilers for different purposes on land, as well as for boilers used on board of vessels, for the smelting of iron and other metal, and for all metallurgical operations, the manufacture of glass and earthenware, and for other purposes, where great intensity of heat is required, the gas is used in combination with atmospheric air, both under a certain artificial pressure, each passing through a separate and distinct pipe to one common burner, at the mouth of which they unite and burn with intense heat. It is preferred to use the gas and air in the proportion of about 2 per cent. of the former to 5 parts of the latter, each under the necessary presure, which is determined by the size of the burners, but other proportions may be used. Instead of atmospheric air, oxygen gas, or a

combination of oxygen gas with atmospheric air, may be used.

When used for the purpose of illumination, the flame from the compressed hydrogen and air, or mixture of air and hydrogen is brought in contact with a solid body such as chalk, which will produce a very brilliant light.

The claims are:

1. For the process of manufacturing hydrogen gas in a manner suited for commercial purposes by passing steam over heated iron filings, or borings of iron crushed, ground, or pulverized as described.

2. The heating of gas-retorts or generators with the hydrogen gas generated by the process combined with air, and under pressure as described.

3. The use of hydrogen gas and air, combined under pressure for heating and lighting purposes, and for all metallurgical purposes, as described.

A patent, in England, has been granted to Frederick Trachsel and Thomas Clayton, both of Manchester, Eng., for "*Improvements in the manufacture of gas, and in the apparatus employed therein.*"

This is an invention for carbonizing atmospheric air, hydrogen, carbonic oxide, and other gases, and rendering them luminous, by impregnating them with matters of a volatile nature, so that the modified air or gas may be conveyed in pipes and consumed for illuminating purposes.

The supply of air may be obtained from gasometers, reservoirs, fans, wind, air-pumps, water-power, water-blast, or any other adequate blowing contrivance.

The materials used are volatile solids or fluids, such as camphor, ether, alcohol, turpentine, camphene, and other essential oils, wood-spirits, coal naphtha, benzole, oils of wood, oils of tar, paraffine oils, petroleum, caoutchine, or oils of a similar nature. These matters may be used either singly or in combination with each other, and will be better adapted for the purpose of impregnating air and gases with the requsite amount of carbonaceous or hydrocarbonaceous particles, if they are further rectified by distillation at any heat below 212° Fahrenheit.

To produce a gas suitable for heating hollow rollers, singeing textile fabrics, or other similar purposes, a retort is used charged with scrap iron or charcoal for the decomposition of steam which is regulated by a self-acting apparatus, on the principle of a float acting upon a valve. This non-luminous gas can also be produced by the action of acids, water, and any corrodible metals.

In carrying out this invention, when it is desired to employ hydrogen gas, or a mixture of hydrogen and carbonic oxide, which may be produced by the action of water or steam upon hot iron or charcoal, as is well known, a regulator is used for the admission of steam, which is self-governing, and which enables the operator to dispense with the use of a gas-holder for storing the gas when so required.

A patent has been granted to J. J. Taylor, of Manchester, for "*Improvements in the manufacture of gas from coal, oil, or other oleaginous substances.*" This invention consists principally in improvements in apparatus for manufacturing gas, for which the inventor obtained a patent dated March 21, 1860. These improvements apply to apparatus when used in extracting gas from coal, oil, or oleaginous substances generally. One or more diaphragms are inserted within the retort containing the oil or other material in order to extend the heating surface and also the travel of the gas through the retort for the purpose of drying or dessicating the gas. The inventor also applies, in connection with the furnace, a water-tank or set of pipes which receives the heat of the furnace, which would otherwise be wasted, and supplies water for domestic and other purposes. One or more drying ovens may likewise be attached to the apparatus by which the waste heat is still further utilized.

NEW LIGHTHOUSE IN AUSTRALIA.—A new lighthouse has been erected at Port Stephens, Australia, in which the light will be a revolving one, of the catophic order, third class, showing alternately a red and white flash. There are twelve strong silver-plated polished reflectors, each 24 inches in diameter and 10 inches in depth, and a patent lamp with brass burners for burning vegetable oil.

NIAGARA FALLS WATER-POWER.—CAPITALISTS AND MANUFACTURERS.

"This immense water-power is now ready for immediate occupation, together with one hundred acres of land, embracing one-quarter of the village, on which to locate mills and manufactories.

"The stipulations for price of power will be one-half that at Lowell, Mass., and the quantity is almost unlimited.

"Should the demand warrant it, the American Fall can easily be stopped and its great volume discharged through the bank below its present site, for mill purposes, under a head and fall of 200 feet.

"The title is perfect and the property unincumbered. For further information apply to N. W. Day or A. P. Floyd, Niagara Falls; Alexander Hay, No. 1208 Vine street, Philadelphia; Hon. T. A. Jenckes, Providence, R. I.; D. Thaxter, Boston; or the owner,

HORACE H. DAY, No. 91 Liberty street.

"New York, September 2, 1861."

We cut the foregoing from the advertising columns of a daily paper. From a reading of it one would suppose that the "Hydraulic Canal," that being the name of the work, we believe, when originally constructed, is so beset with water-power tenants, in the enjoyment of water-power rights, as to render an enlargement of its capacity a probable undertaking; for the public are assured by Horace H. Day, No. 91 Liberty street, New York, that, "*should the demand warrant it, the American Fall can easily be stopped and its great volume discharged through the bank below its present site, for mill purposes, under a head and fall of* 200 *feet!*"

Here, indeed, is a foreshadowing of a future use of the American portion of the mighty cataract! Think of the American Fall which is *nine hundred feet wide*—a vast body of water poured in a great sheet, (or, strictly speaking, in two sheets divided by a little island) down a precipice 165 feet high—being "stopped" in its career, and turned aside from its rocky river bed, to flow gently through a head-race till it reaches wheels fixed to receive its *power* in its fall, afterwards to rush violently through a tail-race into the river!

Who but an India-rubber-man could propose such a use of the "American Fall"? Who but *the* India-rubber-man *has* proposed such a thing, by advertisement?

Seriously, the Niagara Falls water-power is a failure; it is simply a canal starting from a wing-dam in the rapids above the cataract, which, after passing a mile or so through a level town-site, to a basin which is to supply the head-races, discharges its waters through a flume that leads from the basin to the brink of the river's bank, whence a cascade pours down into the channel below, a distance of "200 feet."

When we saw this Hydraulic Canal, a month ago, *there was not a mill upon it*, nor had its owners, so far as we could ascertain, sold a single water-right; the scheme itself, as it appeared to us, was visionary to a degree, wholly without utility, or characteristics or surroundings to commend it to the class of manufacturers whom its projector thought it would attract; and there it is to-day, a ditch of water, idle in its disfigurement of the streets of the village intersected by it.

For water-power purposes a few feet of head and fall are all that are requisite. In the experiments made at Fairmount Water-Works, in this city, (Philadelphia,) in 1860, with Turbine wheels, "for the purpose of ascertaining what proportion of the power employed would be *utilized* by the different wheels, or their co-efficient of useful effect," the wheels were *tested* under a head and fall of *six feet*. And along the bank of the rapids, above the American Falls, the water-power mills there in operation employ but a few feet of head and fall, which is secured by a cheap and primitive structure of logs, serving to dam the water till the required head is obtained for the wheel, the distance between the spots where the water is diverted from the river channel and where it is discharged into it again, measuring not very many yards.

To represent a "head and fall of 200 feet" may do to catch the popular ear, but it has not yet sold any water-rights at Niagara, for no mills have yet been erected on the "100 acres" owned by the Water-power Company. Besides, water-power of sufficient head and fall is a plentiful article on never-failing streams in many parts of the country, *near a market*. But the fact is, steam-power is superseding water-power in many localities, and for many uses. Steam-power mills in great variety exist in this city; and water-power sites are only settled on, now-a-days, after a consideration involving cost of labor, transportation, etc., as well as cost of *power*. There are sites having cheap water-power to commend them, which should be shunned for sundry overbalancing and sufficient reasons; and water-power sites are often shunned and steam-power sites are occupied in their stead, because, in all such cases, the single advantage of deriving power from water, without incurring expense for fuel, is outweighed by other advantages, of measure and moment ample to give direction and control to an undertaking; for, after all, power is only one element in a manufacturing operation, which begins, with a purchase of material and ends with a sale of product—the grower and the consumer being at the two ends of a commercial calculation.—*U. S. Railroad and Mining Register.*

WATER SUPPLY OF BRITISH CITIES.—William Fairbairn, Esq., LL.D., F.R.S., president of the British Association for the Advancement of Science, in his opening address before that body, said: "Amongst the changes which have largely contributed to the comfort and enjoyment of life, are the improvements in the sanitary condition of towns. These belong, probably, to the province of social rather than mechanical science; but I cannot omit to notice some of the great works that have of late years been constructed for the supply of water and for the drainage of towns. In former days, 10 gallons of water to each person per day was considered an ample allowance. Now, 30 gallons is much nearer the rate of consumption. I may instance the water-works of this city (Manchester) and Liverpool, each of which yield a supply of from 20 to 30 gallons of water to each inhabitant. In the former case the water is collected from the Cheshire and Derbyshire hills, and, after being conveyed in tunnels and aqueducts a distance of 10 miles to a reservoir, where it is strained and purified, it is ultimately taken a further distance of 8 miles in pipes in a perfectly pure state, ready for distribution. The greatest undertaking of this kind, however, yet accomplished, is that by which the pure waters of Loch Katrine are distributed to the city of Glasgow. This work, recently completed by Mr. Bateman, who was also the constructor of the water-works of this city, is of the most gigantic character, the water being conveyed in a covered tunnel a distance of 27 miles, through an almost impassable country, to the service reservoir about 8 miles from Glasgow. By this means 40,000,000 gallons of water per day are conveyed through the hills which flank Ben Lommond, and after traversing the sides of Loch Chon and Loch Aird, are finally discharged into the Mugdock basin, where the water is impounded for distribution. We may reasonably look forward to an extension of similar benefits to the metropolis, by the same engineer, whose energies are now directed to an examination of the pure fountains of Wales, from whence the future supply of water to the great city is likely to be derived. A work of so gigantic a character may be looked upon as problematical, but when it is known that six or seven millions of money would be sufficient for its execution, I can see no reason why an undertaking of so much consequence to the health of London should not ultimately be accomplished."

GAS OR WATER?—The consumption of gas is now at least double what it was ten years ago, and the annual quantity manufactured in London is about 8,000,000,000 cubic feet. One-fourth of this quantity, according to reliable estimates, is lost by leakage, condensation, dishonesty and bad debts; and at least one-half of this fourth, or about 1,000,000,000 cubic feet, escapes every year into the London street earth. Mr. Spencer, as analytical chemist to the New River Co., has traced this escaped gas in its destructive action upon the 4,700 miles of metropolitan gas and water mains, until underground London appears to be one vast grave of iron rotting into plumbago. The twelve gas mains, with their eighty joints, which lay side by side with water mains, and telegraphic wire pipes over the sewers in Cockspur street, Charing-cross, are not such a "happy family" as their appearance would lead us to suppose. They are

crowded together like tramps in a three-penny bed, and there does not seem room for a rat to run between them; but there is no real friendship for all this shaking of hands. The defective joints of the gas mains lead to the enormous leakage just described, and the escaped gas, by its action on the street earth, destroys water pipes in a few years that ought to last for a century. Apart from the foul condition of the London street-earth, we are all interested in saving this escaped gas, and this destroyed pipeage, for our gas bills include the cost of the one, and our water bills the cost of the other. While the water-pipes are softened and the gas penetrates the tubes, the water is also adulterated with an undrinkable mixture. I have heard of a letter addressed to a leading water company which ran somewhat in this form: "Mr. Blank presents his compliments to the Blank Company, and wishes to know whether they supply gas or water? Mr. Blank is led to make this inquiry because one of his servants went to the cistern with a pitcher and a candle, and instead of procuring water, she blew up the roof of a wash-house."—*All the Year Round.*

ELECTION OF GAS-METER INSPECTORS IN LONDON.—On Friday, October 4th, an election of three gas-meter inspectors took place in London, at the Metropolitan Board of Works. The number of candidates, originally 158, had been reduced, at a preliminary committee meeting of the board, to 12—viz., Messrs. Airey, Billows, Curley, Davey, Dethridge, Gomme, Laud, P. La Roche, Mills, Pearson, Taunton, and Ward. After several ballots, the number became further reduced, one at a time, to three—viz., Messrs. Airey, Dethridge, and Mills, who were duly elected, and appear to be entirely satisfactory to the gas interest, as the London *Journal of Gas-Lighting*, which rarely speaks well of anybody, says of Mr. Mills that he has for several years discharged the duties of meter inspector in the south metropolitan district in an able manner and with the strictest impartiality; that Mr. Dethridge is an old gas-fitter, was president of the Gas-Fitters' Association in 1851, and has filled the highest offices in the parish where he resides; while Mr. Airey is spoken of as an unknown and untried man, but having before his eyes in the fall of Mr. Taunton "an example of the fate that attends the exercise of ministerial functions in a partisan spirit," it is "hoped that such a warning will not be lost upon him." Rather a left-handed recommendation of Mr. Airey, by the bye. Arrangements are to be made at once for suitable premises for the operations of the meter inspectors, which will be in certain towns the manufactories of gas-meters, fitted up with stamped gas-holders and other apparatus, to which the inspector shall have sole access.

SPONTANEOUS COMBUSTION OF COKE.—It has been noticed, in certain cases, that coke which was supposed to have been sufficiently extinguished by water, rekindled spontaneously several hours afterwards. Herr Freitag explains this dangerous phenomenon by supposing, in such a case, the coke to have been charged with sulphuret of iron and incompletely extinguished, and heaped up in damp places where there was no ventilation. The pyrophorous sulphuret of iron becomes oxidized in such a case, and generates sufficient heat to ignite the particles of coke in contact with it, which gradually propagate the fire throughout the whole mass.

The way to obviate such accidents is, to extinguish the coke with a superabundance of water, and to spread it out until it is cold.

Coal charged with pyrites can also take fire under similar circumstances.—*Dingler's Polytechnisches Journal.*

SOUND CONDITION OF GAS COMPANIES.—While the shares on railroads, banks, and other corporations exhibit fluctuations in value and an uncertainty as to paying dividends upon their capital stock, the condition of gas-light companies shows a marked contrast. Our foreign exchanges are filled with dividend notices of gas companies, and particularly in England, where the price of gas is very low, the returns are large, and afford a gratifying evidence of the profitable nature of the business, and of the accommodation offered to capitalists in the way of investment.

SANTIAGO DE CUBA.—A gas-works in the Eastern Department of the Island of Cuba. Has made no dividend yet. Made about 17½ millions c. f. gas in 1860; light 626 lights, for 612 of which they charge $18,000, and for 14 of them, $451 56 per annum. They sell their coal-tar at 15 cents per gallon, and coke at 40 cents per barrel of 90 lbs. Use 90 per cent. New Pelton Main coal, and 10 per cent. of Cannel, mixed, producing 3½ to 3¾ feet of gas to the pound, and 65 per cent. of coke.

YREKA, CAL.—Wood gas-works; use pitch pine, producing 10,000 c. f., and about 20 bushels charcoal to the cord. They have but 78 consumers and 6 public lamps, which latter they light free of charge. They use 45 wet and 32 dry meters, and report that they prefer Down & Merrifield's meters. They made about 1,500,000 c. f. gas in 1860, realizing $13,288, of which $5,000 was expended in improvements, and balance paid to stockholders. The report concludes thus: "P. S.—Perhaps you expect a compliment for your JOURNAL. I will say that I prize it highly—Wouldn't like to be without it." All right.

PURITY OF THE LONDON WATER SUPPLY.—The analyses of the water supplied in September by the London, England, water companies show that the Chelsea Company's, the Southwark Company's, the Kent Company's, and the New River Company's water contains less organic impurity than is contained in the Loch Katrine water supplied to Glasgow, and considerably less than that contained in the water supplied to Manchester. The water of the West Middlesex, Lambeth, and East London companies contained each rather more than one grain of organic matter per gallon.

IMPROVEMENTS IN STREET LANTERNS.—An improvement in street lanterns has just been introduced in Brussels. The inventor, who has been granted a patent for his invention, places a series of metallic mirrors in in the upper part of the lantern, at such an angle as to reflect downwards upon the street the light which before went upward into the sky. This is a very obvious method of economising the light in the street lamps. It has for years past been repeatedly suggested to the Councils of Newark, N. J., and the wonder is that so simple and useful a measure has not been adopted.

A WAG OF AN ENGINEER.—The Engineer of the Washington, N. C., Gas-light Company, replies to our questions as follows:

Do you use a photometer? We do not; the Company too stingy.

Do you use an exhauster? The works are a pocket exhauster to the lessee.

Does the gas ever freeze in the mains? I didn't know gas would freeze.

The Engineer will probably find his Company's gas and his own gas will freeze before this winter is out, unless North Carolina returns to her loyalty.

THE LIGHT OF TEN THOUSAND YEARS. — George Stephenson, the English railway engineer, one day, while on a visit to Sir Robert Peel, was on the terrace in conversation with Dr. Buckland, the geologist. Suddenly they saw in the distance a railroad train, throwing behind it a long line of white steam.

"'Now, Buckland,' said Mr. Stephenson, 'I have a poser for you. Can you tell me what is the power that is driving that train?' 'Well,' said the other, 'I suppose it is one of your big engines.' 'But what drives the engine?' 'Oh, very likely a canny Newcastle driver.' 'What do you say to the light of the sun?' 'How can that be?' asked the doctor. 'It is nothing else,' said the engineer: 'it is light bottled up in the earth for tens of thousands of years,—light, absorbed by plants and vegetables, being necessary for the condensation of carbon during the process of their growth, if it be not carbon in another form,—and now, after being buried in the earth for long ages in the fields of coal, that latent light is again brought forth and liberated, made to work, as in that locomotive, for great human purposes.' The idea was certainly a most striking and original one: like a flash of light, it illuminated in an instant an entire field of science."

It strikes us that this remark might be made with additional force relative to gas-light. It is applicable to both, and eloquent applied to either.

PATENTS.

UNITED STATES.

2,402.—Joseph Thomas, of New York City, for Improvement in Water Meters:

I claim the stops or projections, I' I", carried by a movable partition, I, on slide, l, double incline, L L', roller, M, and spiral spring, m, or their respective equivalents, arranged and operating substantially as and for the purposes set forth.

2,424.—Edward and E. D. Dithridge, of Pittsburg, Pa., for Improved Lamp Chimney:

We claim a new article of manufacture, consisting of a lamp chimney with a round base and top, and an oval-shaped bulge, arranged and constructed as described, for the purpose set forth.

2,439.—G. H. Mellen, of Hartford, Conn., for Improvement in Filtering Stopper:

I claim a filter and stopper combined in the manner and for the purpose described.

2,443.—A. Odell and W. A. Burrows, of New York City, for an Improvement in Lamps:

We claim the use of the combination of the burner or pipe, a, conical reflector, b, and concave reflector, d, and equivalents when used for the same purpose described and in like combination.

2,453.—John Thomas Way, of London, England, for an Improvement in Electric Light. Patented in England, April 23, 1857:

I claim the employment in obtaining light by electricity of two flowing electrodes, substantially as specified.

2,454.—John Thomas Way, of London, England, for an Improvement in Electric Light. Patented in England, May 4, 1857:

I claim the use of a flowing electrode of mercury or other suitable conducting material, in combination with apparatus for regulating the distance apart of the two electrodes, substantially as described.

And I also claim the combination of an overflowing cup or regulated surface of mercury as a second electrode, with a flowing electrode of mercury in apparatus for obtaining light by electricity, substantially as and for the purpose set forth.

2,456.—Nelson Van Deventer, of New Albany, Ind., for Improvement in Excavators for Water Courses having Currents:

I claim the combination of the rotary shaft, f', disks, f, with teeth set obliquely, and rings, l, securing the said disks, at a proper distance apart, the whole being constructed and arranged as herein shown and described, and operating in connection with the steamboat, A, pivoted frames *c d*, and hoisting apparatus, b s e p, in the manner and for the purpose set forth.

2,467.—T. K. Anderson, of Addison, N. Y., for Improvement in Oil Cans:

I claim the air tube, C, when applied to the can or filler, substantially as shown and described, to admit of the escape of the contents of the can by a proper manipulation of the latter, and at the same time prevent a waste or casual discharge by the upsetting of the can or from other causes, as set forth.

2,471.—B. S. Church, of New York City, for Improvement in Water Meters:

I claim, first, The combination of the two plungers, E D, fitted to work one within and independent of the other, the outer plunger acting as a cylinder into which the water passes to actuate the first, and to be measured, with the compartments, B B' B" passages, 1 I, and f f, arranged and operating substantially in the manner described.

Second, The latches, m m, in combination with the plunger, D, flanges, a a, and tappets, k k, when arranged and operating in the manner and for the purposes described.

2,490.—James Robertson, of New York City, for an Improved Water Closet Utensil:

I claim the combination of the pump, F, water reservoir, C, foul chamber, L, provided with the basin, N, and water seal, M, the basin, N, being provided with a balance pan, O, and the pump, F, provided with an eduction pipe, H, the end, I, of which is arranged relatively with the basin, N, and connected to the lid, K, as shown, and all arranged to form a new and portable article for the purpose specified.

2,500.—Edward M. Wright, of Marysville, Cal., for an Improvement in Nozzles for Hose Pipes:

I claim the use and application of the water chamber, C, formed by the projections, f f, for the use and purpose, and in the manner substantially as set forth.

2,501.—D. B. Chatfield and J. M. Dutcher, of La Grange, Wis., assignors to Thomas Harrison, of Lafayette, Wis., for an Improvement in Water Elevators:

We claim the above described water elevator, in combination with the fans, N, substantially in the maner and for the purposes set forth.

2,502.—B. P. Foster and Wm. H. Chaffee (assignors to Wm. H. Chaffee), of Flint, Mich., for an Improve- in Ditching and Tile-laying Machines:

We claim, first, The arrangement of teeth on the buckets of an endless chain, so that those on one bucket will follow the interstices between the teeth of the one that precedes it, in such a manner as to give alternately different depths of penetration, and these two be followed by a third bucket having a scraper instead of teeth which cleans up the loose dirt which the others have left, as described.

Second, The combination of the guide, 14 and 15, reel, 13, and spout, 29, by which the tiles are laid and covered, arranged to work in connection with an excavating apparatus, substantially as described.

2,546.—B. F. Taber, of Buffalo, N. Y., for Improvement in Rotary Pumps:

I claim, first, The formation of the shell with the concentric parts, e g and f h, and eccentric parts, e h and g f, as and for the purposes described.

Second, So constructing and arranging the valves, valve-cylinder and shell, as that the valves will not be subjected to a transverse movement while doing their work, for the purposes and substantially as set forth.

SOUTHWARK FOUNDRY, PHILADELPHIA.—Our esteemed friends Messrs. Merrick & Son, of the Southwark Foundry, Philadelphia, have received a contract from the government to build an iron-clad frigate of 3,500 tons burden, which is to be ready for sea in eight months. She is to be 240 feet long, 58 feet broad, and 20 feet deep. The iron plates for this vessel are to be 20 feet long, 18 inches wide, and 4½ inches thick. Her armament will consist of sixteen of the most formidable rifled cannon.

MOTIVE-POWER GAS-METERS.—Messrs. Code, Hopper & Gratz, of Philadelphia, manufacture gas-meters geared with power, intended for situations where there is an inadequacy of pressure to supply the requirements of certain consumers, and to obviate the disadvantages of peculiar locations.

GAS IN ENGLAND.—We learn from the London *Builder* that the town of Kinver has been recently lighted with gas. The Neath Gas Co. are building two large gas-holders at the Latt, which, when completed, it is expected will supply the town for many years to come. One of these gas-holders is being built near the canal, and whilst the workmen were engaged in excavating for the foundation, the water suddenly broke in upon them, completely inundating the whole of the works. A new gas-holder has been built at Hendon, Sunderland, of which the diameter is 120 feet, and the depth 50 feet. Its capacity is equal to 600,000 cubic feet of gas.

REDUCTION IN THE PRICE OF GAS IN SCOTLAND.—The gas-light companies supplying the town of Dundee, Scotland, are about to reduce the price of gas from 5s. 6d. to 5s. per thousand cubic feet.

DESTRUCTION OF FISH BY GAS LIQUOR.—The fatal effects of gas liquor upon fish have lately been made manifest in the river Ribble, in the West Riding of Yorkshire, England. The water from the tank of the gas-holder at Settle was allowed to flow into a sewer, whence it was discharged into the river, and nearly all the fish in the stream were poisoned. These fish were mostly trout, chub, salmon-fry, and pike, immense quantities of which were taken out of the river dead. The local papers say that the destruction of life was much greater than if the liquor had been allowed to flow into the stream a few weeks later, as then the trout would have been spawning in the various tributaries of the river, and would have been beyond the reach of the poison. The tank had not been cleaned before for more than five years.

Croton Aqueduct Department.

CROTON AQUEDUCT DEPARTMENT, October 9, 1861.—Public notice is hereby given that a further penalty of ten per cent. will be added to all unpaid Water Rents, on the first day of November next.

R. C. HANCE, Register.

WOODEN GAS-PIPE.

PATENT PREPARED WOOD-PIPE for Gas Mains.—Wm. Stephenson would call the attention of Gas Companies and Engineers to his Patent Prepared Wood Gas-Pipe. This Pipe is prepared in a way so as to effectually prevent its decay, and has been proven to be superior to Iron pipe in three towns where he has erected Gas-Works.

The cost of the Pipe, and the facility with which it can be laid, and *also its not being subject to expansion* and contraction by change of temperature, render it *entirely free from leakage;* there is also less condensation than in Iron pipe. These are among the advantages gained by the use of this Pipe, and are sufficient to recommend it to the favorable consideration of Gas Companies and Engineers; and it is considered, by those who have examined it, as a most valuable improvement.

A sample of this pipe may be seen at the rooms of the AMERICAN GAS-LIGHT JOURNAL, No. 39 Nassau street, New York; and further information, with reference to this Pipe, may be obtained by application to the Patentee,

WM. STEPHENSON, Gas Engineer,
Fremont, Ohio.

WOODEN PURIFYING TRAYS.

WOODEN TRAYS FOR GAS-PURIFIERS.—The subscriber manufactures the WOODEN TRAYS for GAS-PURIFIERS on the invention of Wm. Combe, *cut from solid wood*, which are found superior to the iron plates formerly used, as being cheaper and more durable. The public are cautioned against the statements of R. G. Hunt, published in the AMERICAN GAS-LIGHT JOURNAL, Nov. 1st, 1861, page 137, as wholly without foundation. The following letter is from the Commissioner of Patents:

U. S. PATENT OFFICE, Nov. 9th, 1861.

Sir,—I have to inform you that *no patent has been ordered to issue* to Mr. R. G. Hunt on his application [for solid wood trays or gas sieves] with which an interference was declared with the application of Mr. Hawxhurst, assignee of Wm. Combe. Respectfully,

D. P. HOLLOWAY,
Com. of Patents.

All orders for Solid Wood Trays executed at the shortest notice on reasonable terms by

JOHN L. CHEESMAN,
No. 147 Avenue C, near Tenth st., New York City.

CONICALLY SLOTTED SOLID Wood Trays for Gas-Purifiers.—Admitted to be the best, cheapest, and most durable seives for gas-purifiers ever used.

Secured by Letters Patent of the United States, both for the machinery used in the manufacture, and for the seive itself.

For sale on reasonable terms to Gas-Light Companies or Agents, on application, by letter, to the patentee,

RICHARD G. HUNT,
631 Fourth st., near Avenue C,
New York City.

N. B.—All persons are warned against purchasing these seives of others who falsely pretend to have patents for them. Suits will be commenced immediately against all persons infringing my patents by using or making wooden sieves, but those who hereafter purchase from me can buy their seives cheap and will not be troubled by me on account of former purchases. R. G. H.

MISCELLANEOUS.

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FIRE-BRICK LAYER
AND GAS RETORT SETTER,
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SCAMMON'S GAS-APPARATUS for Private Residences, Factories, Hotels and Cities. See engravings of Rosin and Coal Gas-Works in AMERICAN GAS-LIGHT JOURNAL for Dec. 1, 1860, pages 179 and 180.

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GAS-ENGINEER AND CONTRACTOR,
561 Broadway, New York.

GAS-WORKS ERECTED FOR Cities and Villages. Plans and Specifications furnished for works of any desired capacity, drawings of Retort Settings for Benches of one, two, three or five Retorts.

GAS APPARATUS
of every description.

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DIMMOCK, DWIGHT & CO. Engineers and Contractors for the erection of Coal Gas-Works. Offices 135 and 137 William street, New York City; and No. 2 Elm street, Springfield, Mass.

References by permission:

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AARON CLAFLIN, Esq., "
A. B. WOOD, "
GEORGE BLISS, Esq., N.Y., Pres. M.S & N.I.R.R.Co.
GEO. M. ATWATER, Esq., Springfield, Mass.
JAS. D. BREWER, Esq., Pres. Springfield Gas Co.
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W. C. STREET, Esq., Sec. Norwalk, Ct. Gas Co.

THE AUBIN GAS-WORKS CO., OF ALBANY, N. Y., refer to the following Gas-Light Companies using their Works, to prove that Gas stocks can pay handsomely, and yet a rich and *cheap* Gas be made, viz.: Plattsburgh, Whitehall, Palmyra, Waterford, Bath, Amsterdam, Fort Plain, N. Y.; Rutland, Vt.; Flemington, N. J.; Smyrna and Dover, Del.; Jersey Shore and Pittston, Penn.; Greensboro and Salem, N. C.; Sorel, St. Hyacinthe, and Point Levi, Canada. Agents wanted to extend the sale of the Aubin Portable Gas-Works, unsurpassed for simplicity, safety and economy.

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WORTHINGTON'S STEAM PUMPS, extensively used by Gas-Light Companies. For Sale at greatly Reduced Prices.

Also, a new and highly successful Pump, driven by water pressure, requiring no attention or repairs, and the most economical water motor yet constructed.

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Improved Fans for Ventilating Hospitals and other Public Buildings.

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PARIS'S PATENT
Glass-Enamelled Wrought Iron Tubes,
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LAP-WELDED IRON BOILER TUBES.

TUBES FOR ARTESIAN WELLS, CONVEYING STEAM OR WATER, SHAFTING, &c., SCREWED OR COUPLED TOGETHER, in various ways.

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CAST AND WROUGHT IRON Pipe, Branches, Elbows, Sleeves, &c. Lamp-Posts, Wrought-Iron Lanterns for Lamp-Posts, Gas Retorts (clay or iron), Street Mains in 9 or 12 feet lengths. Sheet-Iron cut to pattern for Gas-holders. For sale by the Manufacturers' Agent,

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HUNTER, KELLER & CO., Manufacturers of
WROUGHT-IRON PIPES & FIXTURES,
of all descriptions, for
STEAM, WATER AND GAS.
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ORNE'S PATENT FILTER-REGULATING GAS-BURNER, admitted by all practical and scientific men, who have examined its movements, to be

THE BEST GAS-BURNER YET INVENTED.

They are self-regulating, gas-purifying, indestructible, and most economical.

For sale by S. A. STETSON & CO.,
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PERFECTION.—This recent Improvement in Gas-Burners embraces the great economy of the Hicks Patent Burner, a gain of over 75 per cent. in light. This Burner is now offered to the Trade and all consumers of gas, at the price of the common burner. It is anti-corrosive, gives a uniform and beautifully-shaped blaze, under any pressure, and will not get out of order.

It has been adopted by the Manhattan and Brooklyn, N. Y., Gas-Light Cos., for street lamps.

Samples will be sent to each Gas Co. in the United States, if requested.

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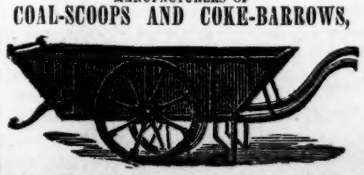

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NEAR NEWCASTLE-UPON-TYNE, ENGLAND,
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Dealers in Tiles, Arch-Bricks, Furnace-Doors, MOUTH-PIECES, COVERS,
And all other Fittings, of the most approved patterns, for setting Clay Retorts.
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Manufacturer of all kinds of FIRE-BRICK, GAS-HOUSE TILES, to suit all the different plans in use. Clay Retorts and Dentists' Muffles. Orders filled at short notice

PATENT PYRO-CLAY GAS RETORTS. THOMAS HOADLEY, Patentee, wishes to call the attention of Gas-Engineers to these

RETORTS,

as a very superior article.

REFERENCES:—Gas-Light Works, Buffalo, N. Y.
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" " Chicago, Ill.

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NEW YORK FIRE-BRICK Manufactory. (Branch Works at Kreischerville, Staten Island.)

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GAS-HOUSE TILES and FIRE-BRICK of all shapes and sizes. FIRE MORTAR, CLAY, and SAND articles of every description made to order at the shortest notice. B. KREISCHER, M. MAURER, A. WEBER.

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CELLULAR GAS-RETORTS.—C. M. CRESSON'S CELLULAR Gas Retorts, Patented October 3d, 1854. Adapted to the manufacture of GAS from Rosin, Coal, Wood, &c., and now in use at the Philadelphia Gas Works. Patent Rights for sale. For information apply to HENRY S. HAGERT, Attorney for Patentee, S. E. cor. of Walnut and Sixth sts., Philadelphia, Pa.

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H. R. WORTHINGTON'S PATENT Water-Meter.—This Meter combines accuracy, simplicity and remarkable durability, with such ease and certainty of motion, as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. These qualities, with its low cost, have caused its extensive adoption by corporations and individuals, in many of our largest cities.

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FREEZING OF GAS-PIPES.—Walton's Patent Anti-Freezing Apparatus illustrated by Engravings in the AMERICAN GAS-LIGHT JOURNAL, of Jan. 1, 1861, page 212, is the most simple, durable and efficient of any known process.

See also certificates from Cincinnati, O., and Louisville, Ky. Gas-Works in same number, page 2

Address, JOHN WALTON,
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THE
STERLING GAS-REGULATOR,
Improves the Light and Saves a Large Per Centage of Gas.

MANUFACTURED BY THE
WHEELER & WILSON SEWING MACHINE COMPANY.

It is well known that Printers require the best and most brilliant light. In proof of the superiority of these Machines over all others, the following New York establishments are using them, and testify to their excellence:—New York Times, New York Herald, New York World, New York Tribune, New York Sun, Journal of Commerce, Courier & Enquirer, Evening Post, The Zietung, Dispatch, Leader, Scientific American, Advertiser and Spectator, Independent, Daily News, Harper's Monthly and Weekly, Transcript, Mercury, Atlas, Life Illustrated, Albion, Spirit of the Times, AMERICAN GAS-LIGHT JOURNAL, Christian Enquirer, Churchman, Church Journal, Christian Advocate, Christian Ambassador, Christian Intelligencer, Observer, Sunday Times, Sunday Courier.

By order of the New York and Brooklyn Common Councils, these Regulators are now used in the City Halls, Police Stations, Markets, and other Public Buildings in both cities.

They are Warranted by the
WHEELER & WILSON SEWING-MACHINE CO.,
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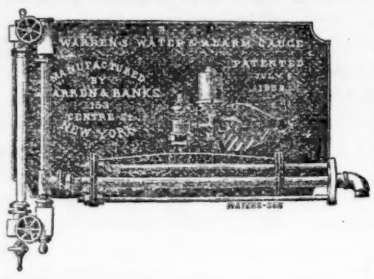
To keep in order, and always maintain the pressurs of the Gas at the lowest point for a brilliant light and economical combustion. They are so constructed that *under no circumstances can the Mercury get into the Meters, or in any way injure them.*

WARREN'S PATENT WATER & ALARM GAUGE,
For Protecting the Flues and Preventing Steam-Boiler Explosions.



This is a reliable High and Low Water Detector, arranged so as to render it one of the best Water Gauges ever attached to a Steam-Boiler; always presenting before the Engineer at sight the exact height of the water, and if, by oversight or by sudden leakage, the water gets low in the boiler, it will cause an alarm before the water gets below the flues, thereby preventing an explosion. This Gauge can be made to alarm at any point desired as a High Water Detector, thereby preventing the water from getting to that height as to be forced into the cylinder of the engine, often causing serious accidents. Thus it is a High as well as a Low water Detector. For sale by

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153 Centre st., corner of Canal st., New York,
Where a Gauge is constantly in operation.

GAS, STEAM, SMOKE,
PURE WATER & SOIL PIPE,
FROM
JOSEPH CLIFF,
Wortley Fire-Brick Works, Leeds, England.

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No. 4 Irving Place, N. Y.

JOHN RUSSELL & CO.,
PATENT TUBE MAKERS,
THE OLD TUBE WORKS, WEDNESBURY, AND THE ALMA WORKS, WALSAL, STAFFORDSHIRE,

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The original Manufacturers of WROUGHT-IRON GAS TUBES, and the Inventors of the Lap-welded Tubes for Locomotive and Marine Boilers. All kinds of TUBES and FITTINGS, whether for Gas, Steam, or Water. Galvanized and Composition Tubes. Chandeliers, and every kind of Brass work for Gas and Steam.

STOCKS, DIES, AND TAPS OF ALL SIZES. CAST-IRON PIPE AND GAS-METERS.
All Goods Warranted.

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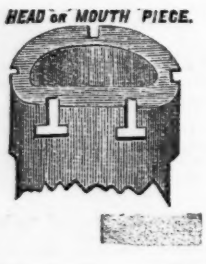
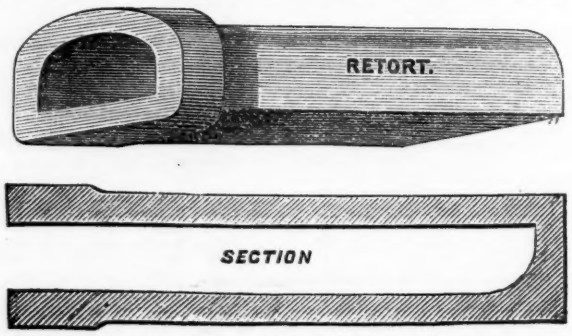




KING BROTHERS beg especially to call the attention of Gas Companies to the superiority of their Retorts, which are made from the celebrated STOURBRIDGE FIRE-CLAY. Mr. King has patented a Kiln for Burning Retorts, by which Patent all Cold Air is excluded from the Kiln while burning, thus rendering them

Free from Cracks and Correct in Form.

By great care in Manufacturing, combined with the advantages in Burning, a VERY SMOOTH SURFACE is obtained, rendering them less liable to carbonize.

RETORT OVENS, FIRE-BRICKS, GUARDS, SADDLES, RABITTED BURS, FLUES, AND QUARRIES, ARE ALL MANUFACTURED OF THE SAME QUALITY OF CLAY.

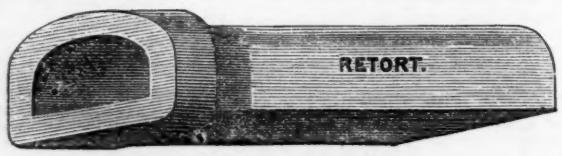
EVERY RETORT AND BRICK IS BRANDED "KING BROTHERS, STOURBRIDGE."

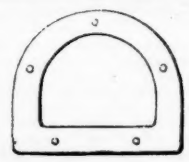
Apply to E. W. BARSTOW, 83 Maiden Lane, New York, where samples can be seen.

HARRIS & PEARSON,
PROPRIETORS OF
Best Glass-House Pot & Crucible Clay.

Manufacturers of Fire-Bricks, Gas-Retorts, and Glass-House Furnace-Bricks of every description.
AMBLECOTE FIRE-CLAY AND BRICK WORKS, STOURBRIDGE, ENGLAND.

OWEN'S PATENT FIRE-CLAY RETORTS.





JOSEPH COWEN & CO.,
BLAYDON BURN, near Newcastle-on-Tyne, England,

Have always been, and are still, the most extensive manufacturers of FIRE-CLAY RETORTS in the United Kingdom, and were the only parties to whom a Prize Medal was awarded at the Great Exhibition, in London, 1851, for

"GAS RETORTS, AND OTHER OBJECTS IN FIRE-CLAY."

J. C. & CO. make Fire-Clay Retorts of all shapes and dimensions, and to fit existing mouth-pieces.

Orders for FIRE-CLAY RETORTS, TILES, BEARERS, and other articles in Fire-Clay, receive immediate attention, and are promptly executed at their Works, as above. Drawings of Settings adapted for Cowen's Patent Fire-Clay Retorts supplied.

AGENTS, MESSRS. MEAD & BELL,
13 CLIFF STREET, NEW YORK.

N. B.—J. C. & CO.'S RETORTS are well adapted for small Gas-Works, as they can be used without an Exhauster.

POTTS' REVOLVING SIGNAL LIGHTS,

PATENTED SEPTEMBER 8, 1857.

Mr. ALBERT POTTS, the well known Inventor of the LAMP-POST LETTER-BOXES, which have been adopted by the Post-Office Department for the large cities of the United States—and also of the GAS METER BOX, to be set in the front walls of houses, thus doing away with visits from Gas Inspectors, or burglars in gas-clothing, has lately brought forward a third Invention, which in point of importance and world-wide usefulness, surpasses the others entirely.

These SIGNAL LIGHTS are intended for use on Vessels propelled by Steam, and those exclusively. They specially indicate the presence of a Steamer, and by their use, there will be less likelihood of mistakes, and consequent collision than at present. They are also intended for SIGNALLING AT NIGHT, and can be used for that purpose UNDER ANY CODE of SIGNALS NOW ARRANGED FOR FLAGS.

This Improvement in Lights for Steam Vessels, consists in having the Lanterns containing the colored lights, connected by means of a series of cogged gearing with some convenient part of the Engine or Machinery, so as to cause them to have a revolving motion around their axis. On side wheel steamers, the Lanterns should be placed directly over the wheel-houses, and the power, or motion to turn them, may then be very conveniently obtained from the paddle wheel shaft. On Propellers, the Lanterns should be placed on each side of the Pilot House, or hurricane deck, and the rotary motion derived from any convenient or suitable part of the Engine or Propeller Shaft. Each Lantern is supported on the end of movable cranes, so that their relative positions may be changed and properly adjusted to suit the view of observers on either side of the vessel at the time of signalling.

The Lanterns to be used in this improvement may be constructed for Burning Oils, Fluids, Gas, or any of the known modes of illumination, and should be furnished with one or more lenses and reflectors, so as to concentrate the rays of light, and project them over the horizon with the greatest intensity. The lenses for this purpose should be made with colored glass, viz., Red and Green, and the position of the respective Lanterns, according to the color of the lenses therein, must be placed on the sides of the vessel so as to answer to the requirements of Rules and Regulations made and published by the Supervising Inspectors of Steamboats, agreeably to the Act of Congress of the United States in such cases made and provided. That is to say—by said Regulation—the Lantern having the green lenses for producing the Green Colored Light, must be placed on the starboard side of the vessel, and the other Lantern producing the Red Light, to be placed on the port side thereof In pursuance, also, of the aforesaid Rules and Regulations, there is to be found in board and behind each Lantern, a screen to answer the purposes therein mentioned.

The cogged gearing, by which the Lanterns are connected with the Engine or paddle wheel shaft, and thereby caused to revolve when the Engine is in motion, is so arranged that the connection may be readily shipped or unshipped, and the lanterns made stationary or otherwise, at the pleasure of the Pilot, or those whose duty it may be to operate and attend to the same. The cranes on which the Lanterns are placed, are also rigged so as to be readily turned horizontally from one position to another, so as to present one or both lights to the view of observers when laying athwart ships at the time of signalling.

On the Use and Application of the Improvement for Night Signals.

When the vessel is under weigh, or going ahead in its course, the Lanterns are to be placed directly athwart ships, so that such colored light therein will then have the position and place prescribed by Rule Seventh of the aforesaid Supervising Inspectors of Steam Boats, and with the screens behind them, as above described, will then answer all the intents and purposes for which the colored lights are thus required to be used, as illustrated in the several diagrams published by said Inspectors for the working of a system of Colored Lights. The Lights in this case, according to the color seen by the observer, indicate the course or direction of the vessel whereon they are carried When the Lanterns with the colored lights therein, are made to revolve around on their axis, as proposed in this improvement, in addition to the signal above, another, and as we believe, very important and useful signal is thus formed, indicating that the vessel, whereon it is carried is a Steamer. In dark foggy nights, it is found by experience, to be somewhat of a difficult task to distinguish sailing vessels from Steamers and Propellers, especially when the latter are rigged, and carry a press of sail. When Steamers meet "head and head," it is the duty of each to pass to the right, or, on the larboard side of the other. Whereas, when a Steamer meets a sailing vessel, the former must give way and allow the latter to pursue its course. Hence, to carry out the regulations of the said Steamboat Inspectors, and prevent collisions, it is important to have some infallible sign, whereby the character of the vessel may be readily seen and determined. Several very fatal collisions have recently taken place through mistakes of this kind.

On Signals for Speed and Distance.

The gearing of the Lanterns with the paddle wheel or propeller shaft, may be so arranged as to be an index of their speed A very good proportion, would probably be to make the Laterns turn about one third as fast as said shaft. Hence, when the speed of the vessel is previously known, when making a certain number of revolutions of the paddle or propeller, it becomes an easy task from observing the time with which the Lanterns thereon may be turning to approximate to the speed with which the said vessel is moving at the time of observation. Again, as the arcs described by the rays of light from each lantern, as they revolve around on their axis, is greater in proportion to the distance from said lantern, so will the time in which said rays move over any given space, be less in the same proportion. Hence, when the lights are very remote, or far off, from the observer, the duration of each column or cylinder, of rays from each lense, would pass the eye of the observer, in a short space of time, or with great velocity. Whereas, at a nearer point of observation, the time of its passage would be considerably lengthened, or the motion thereof apparently much slower. From these facts, we believe the improvement is susceptible of indicating, in an approximate manner, the speed and distance of vessels whereon the revolving lights may be used.

On the Application of the Improvement for Marine Telegraphic Purposes.

The Revolving Lights can be readily applied to the general purposes of Marine Signalling at night, as follows: In order to show this application, we have adopted the Numbers as given in Roger's Code of Marine Day Signals, believing that work to be somewhat of a standard in matters of this kind. Instead of the flags used in the above code, for day signals, to indicate the combinations of two or more letters of the Alphabet, which combination is referable to certain numbers indicative of the words or sentences telegraphed, we propose to perform the same operation, at night, by means of the two revolving colored lights, so as to indicate the numbers directly to which the intended words or sentences to be telegraphed are referable. Thus, whether the vessel to be signalled is ahead, astern, or abaft the beam, the position of the two colored lights must be so adjusted, by means of the moveable cranes, whereon said lanterns or lights are fixed, that the two lights may be fully made visible to the observer. When both lights are thrown into this position, stopping the motion of the lanterns may be the signal for calling attention, or a rocket fired off, or the steam whistle blown, would answer the same purpose. Now, in order to represent the ten numerals, we propose to indicate them by the respective motions of the two colored lights, as follows:

RED LIGHT.				GREEN LIGHT.			
One Red,	Represents	Number	1.	Two Green,	Represents	Number	2.
Three do.	do.	do.	3.	Four do.	do.	do.	4.
Five do.	do.	do.	5.	Six do.	do	do.	6.
Seven do.	do.	do.	7.	Eight do.	do.	do.	8.
Nine do.	do.	do.	9.	One do.	do.	do.	0.

In the above arrangement, it will be seen that all the odd numbers are made by the Red Light, and the even numbers by the Green Light. In order to indicate the repeat of the last number, once or more times, or for other special purposes, which may hereafter be found useful and necessary, an even number of lights may be shown by the Red, and an odd number by the Green. It will be understood that when the Lanterns are made with three lenses in them, the numerals as above arranged are formed by the number of times a new light or lense is presented to the observer. Thus to indicate the number 3, the Red Light or Lantern would make one entire revolution; and to make the number 6, the Lantern carrying the Green Light would make two revolutions, and so on with the other numbers. When a symbol is made, the motion of the Lantern is to be suspended for a short time, and when a number expressing a sentence is formed, the lantern may be stopped for a longer period, or some one of the special signals above referred to, may be used for this purpose.

To show the application of this improvement as above mentioned, whereby these Lights can be used as readily for Night Signals, as Flags are used for Day Signals by the author of Roger's Code, we shall use the sign O, colored red or green, according to the light used, to show the number of movements performed by the respective lights in order to represent any desired number of said code, suitable for the required purpose.

RED LIGHT.	GREEN LIGHT.
O, O, O, O, O,	
O, O, O, O, O, O, O.	
	O, O.
	O. O.

The above would represent the number 5722, and by reference to said Roger's Code, would be found to stand before the sentence:
"WILL YOU SHOW THE NUMBER THAT REPRESENTS YOUR NAME?"

RED LIGHT.	GREEN LIGHT.
O.	
O. O, O, O, O.	
O, O, O, O, O, O, O.	
	O, O.

Here the number expressed is 1572, and per the same Code, stands for
"WHERE ARE YOU BOUND?"

RED LIGHT.	GREEN LIGHT.
O.	
O, O, O, O, O, C, O, O, O.	
	O, O.
	O, O, O, O, O, O, O, O, O.

The number thus expressed is 1928, and per said Code is
"WHAT IS YOUR CARGO?"

RED LIGHT.	GREEN LIGHT.
O, O, O, O, O.	
	O, O, O, O, O, O.
	O.
O, O, O.	

Here the number expressed is 5603, and stands for
"HAVE YOU ANY NEWS?"

(RED LIGHT.)

Fig. 2

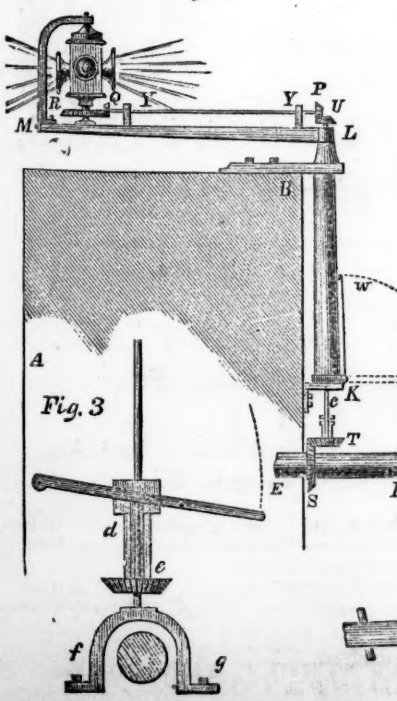


Fig. 3

(GREEN LIGHT)

Fig. 1

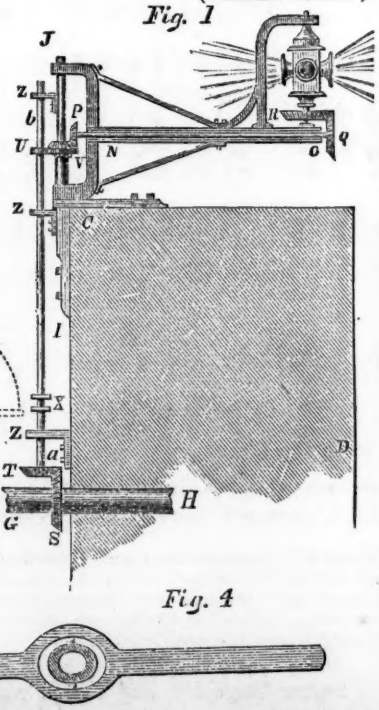
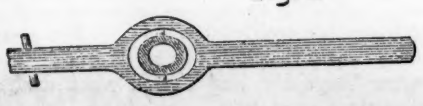


Fig. 4



MECHANICAL CONSTRUCTION.

In our engravings, Figs. 1 and 2, represent Vertical Sections through the wheel-house. In them E F and G H represent portions of the main Shaft. In Fig. 1, I J is a stout Iron or Wooden post, fastened against the side of the wheel-house, directly over the main shaft On the upper part of this post, is fitted the moveable arm or crane N O, to the main shaft is fitted the bevel wheel S, and to the lower end of the rod a b, is fitted a corresponding wheel T. U is a small pinion on a b, which gears with the spur wheel, V, which in turns gives motion to the wheels, P and Q, and so revolves the lamp R. It will be seen that a Rotary motion is given to the lamp, when the main shaft is in motion and a b connected.

It can be disconnected by a lever, acting between the bosses X, which will elevate the rod in the guides Z Z Z.

Fig. 2 is another arrangement, for the same purpose. In this, K L, represent a hollow Shaft, on which is firmly fastened, the arm L M, on which is the lantern. The hollow post is secured to the wheel-house by the straps K and B, and it can turn freely in them, the other part being the same in them as in fig. 1

The lever K W, when drawn down, will turn the frame in any required position around the Shaft c U. In fig. 1, the arm or crane N O, may be operated by cords from the wheel house, but in this device, the rod c U, does not lift up as in fig. 1, but in its place, the lower end is made square, and on it slides the short tube, d E shown in fig. 3 The lower end of the rod turns on a bridge, f g, spanning the main shaft On the upper end of the tube, d e, a lever is attached by means of boxes and collars as shown in fig. 4. This lever when raised carries with it the beveled wheel T, thus disconnecting the gearing apparatus.

ALBERT POTTS, Patentee,
PHILADELPHIA, Pa.

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